

AVIATION WEEK

Special Report...
AIR MATERIEL COMMAND

AUG. 4, 1952

THIS
ISSUE
\$2.00

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Our Armed Forces Rely on... **BG**



↑ GAS TURBINE IGNITERS by BG



GAS TURBINE THERMOCOUPLES by BG ↓



↑ AIRCRAFT SPARK PLUGS by BG

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Of special interest to AMC personnel . . .

Just off the press, *combustion engineering* 40 page brochure that tells the story of combustion engineering progress from early heat treating furnaces to the latest burning developments for military and commercial requirements. Write for your copy.

COMBUSTION EQUIPMENT FOR ALL REQUIREMENTS

Proven Janitrol equipment for military applications includes trailer heaters, a complete line of aircraft combustion heaters and components, from 15,000 to 700,000 lbs per hour capacity . . . waste gas processors . . . portable self-contained ground heaters . . . and liquid and radiant heaters for ground vehicles and stationary engines.



Janitrol combustion equipment is on fire or has been specified on: C-124A & C, YRC-124B, C-119, JC-119B, T-89D, 12F-1, AF-2W, N-19, N19-1, C-171D, MUP-2, N-21, B-25, F-51, C-47F, AUC-8, C-119A, P1V-4, P2V-5, P2V-6, F-28, C-100, F4U-7, ZPN, Dorygale, S-35, C-125, DC-6, DC-6A & B, DC-7, DC-8, 10C-3, CP-246, Hums 4-6-4, 3-6-3A, T-6J, 4-3, Tee Tag, 610 & 511A fire fighting vehicles, GC-4 trailer and others.

FOR PIONEERING

When you call in the heated Janitrol Associates Division, for research and development of equipment to meet new far-reaching requirements, you also tap the resources of five other divisions in the Surface Combustion organization. For proven products . . . or pioneering . . . it's never too early to call in your Janitrol representative.

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Columbus, Ohio: PHA A. Miller, Frank Deal, USAF Coordinator
Columbus, Ohio: Engineering, Production, and Sales, 490 Dublin Ave.
Tulsa, Okla.: Headquarters

AIRCRAFT AUTOMOTIVE DIVISION, SURFACE COMBUSTION CORPORATION, TORRINO 1, ITALY

HEATER WITH THE SHIELDING FLAME

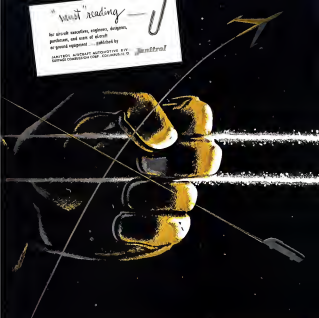
Janitrol 

HEAT IN HARNESS

*the story
of teamwork in
combustion engineering*

"must" reading — 
for aircraft executives, engineers, designers,
purchasers, and users of aircraft
or ground equipment . . . published by
JANITROL AUTOMOTIVE DIVISION
SURFACE COMBUSTION CORP. TORRINO 1, ITALY

Janitrol



CONTRACTORS' GUIDE TO

LIVING IN DAYTON

MOTELS

- 1 Adlon
- 2 Astor
- 3 Van Cleve
- 4 Alton
- 5 Gables
- 6 Alton
- 7 Holden

RESTAURANTS

- 8 Roy's Coffee Shop
- 9 College Inn
- 10 Green Hall
- 11 Diner
- 12 The Whisking Post
- 13 Adair's Room
- 14 New Court
- 15 Santa & Bull
- 16 Saville
- 17 McKenney's Buffet & Grill
- 18 French Village

DEPARTMENT STORES

- 19 Scott, Brebeck & Co.
- 20 The House Store
- 21 Adler & Childs
- 22 Ray's
- 23 Kier's
- 24 McCrory's
- 25 Elder & Johnson Co.
- 26 S. S. Knapp Co.
- 27 W. T. Grant Co.

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TRANSPORTATION

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COMMUNICATION

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CROUSE-HINDS offers all 3 types of high intensity airport runway lights

The Crouse-Hinds Company offers all three types of high intensity fixtures to meet the three CAA Specifications (L-819, L-819 and L-820). All three fixtures (Types HRC, HRL and HSL) are approved by CAA.

Type HRC utilizes a double prismatic lens system on a cast aluminum base, with a 500-watt, 115-volt lamp mounted on a movable socket. The main beam may be "flood in" or "flood out" by remote control from the tower to provide the best setting for particular visibility conditions. The candlepower is the highest of the three types. In bad weather the pilot sees more lights and sees them sooner with this system.

Type HRL is constructed with an optical plastic type globe mounted on a 3-piece cast aluminum fixture assembly. Each fixture uses a 500-watt lamp and is provided with a series-to-series insulating transformer installed underground in the base housing.

This system has the lowest installation cost. Its use is often justified for non-instrument runways, as well as instrument runways.

Type HSL has a cast aluminum housing with two 55-watt sealed beam high intensity lamps

inside and a 35-watt medium intensity light on top. Three insulating transformers are installed underground in the base. Each of the three lamps may be switched separately from the tower.

This system is economical to operate, since only 95 watts is used for the high intensity beam, and a 35-watt light is used in good weather. This fixture provides a main beam in only one direction, without the background haze resulting from the "back beam". After relamping, the sealed beam optical system is back to 100% initial efficiency.

All three fixtures provide the basic high intensity candlepower required and the three types have many construction features in common such as cast aluminum housing, three glassware, disconnecting cable connector, same breakable coupling and standard steel base with base plate. All three units provide the necessary top light and side light needed for planes not on the approach path and all use a 5-stage brightness control.

Write for Bulletin 203-F. It contains detailed features and an impartial comparison of the relative advantages of the three systems with estimated installation costs of each.

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.



AIRPORT LIGHTING • FLOODLIGHTS • CONDULETS • TRAFFIC SIGNALS



for the
aviation industry

...mechanical drives
...power transmissions
...gears and assemblies

Many of the nation's leading aircraft are equipped with mechanical drives and power transmissions manufactured by Foote Bros. On aircraft engines, both reciprocating and jet, you will find Foote Bros. gears that meet extremely high load requirements coupled with exacting standards of dimensional accuracy, minimum size and weight.

Foote Bros. engineers have had wide experience in the development of gears and aircraft devices to meet unusual conditions of high speed, low weight and compact size. These large plants are equipped with the newest machinery and heat treating facilities to produce precision gears, housings and other components to meet the most rigid specifications.

Foote Bros. is one of the oldest and largest manufacturers of power transmission equipment in the country, with a long history of service to the aircraft industry. Our engineers may be able to help you solve the problem you may be facing on the design or application of aircraft devices.

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Gears, Power Transmissions Through Better Gears



LEWIS

Complete
Temperature Measuring
Systems for Aircraft

... Sturdy
... Accurate

Hermetically Sealed TEMPERATURE INDICATORS
TO "AN" AND AIR FORCE SPECIFICATIONS

THERMOCOUPLE THERMOMETERS

STANDARD RANGES FOR CYLINDER, BEARING OR EXHAUST TEMPERATURES



3" GAGE INDICATOR
WITH MOUNTING BRACKET



2 1/2" DIAL INDICATOR



3" GAGE INDICATOR
FOR RING CLAMP MOUNTING

RESISTANCE THERMOMETERS

STANDARD RANGES FOR CYLINDER, OIL, FUEL OIL, COOLANT, EXHAUST OR HEATING DUCT TEMPERATURES



3" GAGE INDICATOR
WITH MOUNTING BASE



5 1/4" GAGE INDICATOR



3" GAGE INDICATOR
FOR RING CLAMP MOUNTING

RESISTANCE BULBS • THERMOCOUPLES • THERMOCOUPLE WIRE

STANDARD • INTERACTING

ADJUSTABLE • RELIABLE

PRECISE • ACCURATE



A-4, P-40, P-51, P-52, P-53, P-54, P-55, P-56, P-57, P-58, P-59, P-60, P-61, P-62, P-63, P-64, P-65, P-66, P-67, P-68, P-69, P-70, P-71, P-72, P-73, P-74, P-75, P-76, P-77, P-78, P-79, P-80, P-81, P-82, P-83, P-84, P-85, P-86, P-87, P-88, P-89, P-90, P-91, P-92, P-93, P-94, P-95, P-96, P-97, P-98, P-99, P-100



TO A-4
SPECIFICATIONS



TO A-4 AND
MILITARY
SPECIFICATIONS

TO INSURE ACCURATE, RELIABLE TEMPERATURE INSTRUMENTATION, USE LEWIS BULBS, THERMOCOUPLES, LEAD WIRE, FIREWALL BLOCKS, RESISTORS AND INDICATORS

THE LEWIS ENGINEERING CO.
NAUGATUCK, CONNECTICUT

Manufacturers of Complete Temperature Measuring Systems for Aircraft

BROOKLYN

was "unprintable"

Recently, The Consolidated Edison Company (in New York City) faced this problem: It had to produce a direct-process print from each one of some three thousand Brooklyn Underground Record Maps, showing the distribution system of electric service.

But satisfactory prints could not be produced directly from these maps. They were up to 30 years old... had been referred to constantly... and as a result were rolled, stained, creased, and "dog eared."

What to do? Retracing was out of the question, since it would take a draftsman from two to three days to trace and check just one of these 17" x 25" drawings.

Kodagraph Autopositive Paper
was the speedy, economical solution

With this revolutionary photographic intermediate paper, approximately 40 sharp red clear "daphne originals" could be turned out in no more than 100 or so hours because

Kodagraph Autopositive Paper produces positive copies directly—without a negative step, without developer handling. At the same time, it drops out stains, creases, discolors up backgrounds... transforms weak detail into dense photographic blacklines. Furthermore, Autopositive Paper can be exposed in standard print-making equipment... and processed in standard photographic solutions. Thus, Consolidated Edison obtained—in record time and at minimum cost—a complete set of daphne originals, which were used to produce the required direct-process prints... and were then filed away for future reference work and print-making needs.

Kodagraph Autopositive Paper

"THE BIG NEW PLUS" is engineering drawing reproduction

Learn in detail all the ways you can save with Kodagraph Autopositive Paper—the revolutionary photographic intermediate material which you, as your local blue-printer, can process quickly economically... at low cost. Mail coupon today for free booklet!

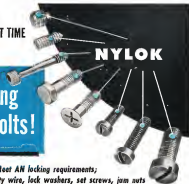
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Industrial Photographic Division, Rochester 4, N. Y.
Gentlemen: Please send me a copy of "New Short Cuts and Savings", describing the many savings Kodagraph Autopositive Paper is bringing to industry.

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TRADE MARK

Now - FOR THE FIRST TIME

Self-Locking Screws, Bolts!



**Meet AN locking requirements;
Eliminate safety wire, lock washers, set screws, jam nuts**

Now the Nylok principle of locking threads with the smooth wedging action of a nylon plug has been applied to screws and bolts.

The new Nylok screws and bolts are self-locking in any position, raised or lowered. They lock where stopped, they

disengage easily, time-consuming safety wiring and lock washers. No threaded fasteners, no locking nut. Locking is positive even when raised against gaskets.

Nylok also enables you to design for simplified loosening, with full safety, for faster assembly time and easier servicing.

Previously available in sizes of 1/8 to 1/2 inch, lengths 1/2 inch up



New Nylok Locks
Positive nylon plug (1) sets up lateral thrust, instantly wedging itself into mating threads (2). All of locking action is in the lateral thrust is not absorbed in the positive action of the nylon plug.

Superior Torque
Nylok screws achieve high torque torque, in inch pounds, after repeated loosening, compact with AN requirements. Curve is for 10-30 inch after stress the equally superior in experiments.

Adjusting Mechanisms
Nylok screws achieve high torque torque, in inch pounds, after repeated loosening, compact with AN requirements. Curve is for 10-30 inch after stress the equally superior in experiments.

Vibration Proof
With nylon plug, screws, bolts, nuts and jam nuts become military built assemblies which have used in desert proving ground tests. Locked with Nylok, assemblies fastenings with 100 lb. pull after 20 day test.

NYLOK

offers these Advantages:

- Positive locking
- Eliminates safety wire, lock washers, jam nuts
- Reusability
- Interchangeability
- Locks without setting
- Standard head sizes, types
- Standard thread lengths



THE NYLOK

Division of Nylon Locks
Patented. Covered by U. S.
patents and patents pending

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requirements to
**INSTRUMENT CORP.
OF AMERICA**

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SLIP RING AND COMMUTATOR ASSEMBLIES

The Instrument Corporation of America plant contains the most modern and complete facilities available anywhere in the world for the exclusive production of miniature slip-ring and commutator assemblies to precise standards. It is now in full scale production to meet your requirements in the fastest possible time at the lowest possible cost.

ALL TYPES OF CONSTRUCTION NOW AVAILABLE
INCLUDING WOUND OR FABRICATED TYPES

Assemblies of these types can be supplied at low cost. Quality is the highest in the industry. Dimensional accuracy and other characteristics are excellent and these units are highly recommended for instruments such as synchros.

ONE PIECE ELECTRO-PLATED
TYPES FOR EXTREME ACCURACY

Whereas extreme dimensional precision, accurate concentricity and high dielectric qualities are required, the electro-deposition method is recommended... the production of which is limited under an exclusive arrangement with the Electro-Tec Corporation.



TYPICAL
SPECIFICATIONS:

Size: 500" to 10"
Excitation or Fed
Circuit: 500 to 5000 V or more

Frequency: 50 to 60 Hz
Motor Inertia: 0.001 to 0.010 in-lb

Load Capacity: 1000 V or more
1000 to 10000 RPM

Surface Protection: Polishing and
Anodizing or Gold Plating or Silver Plating

Our engineering staff is at your service at all times for consultation

INSTRUMENT CORPORATION OF AMERICA

BLACKSBURG • VIRGINIA



When you *TEST*, use the *BEST*...

...from *VHF* to *EHF*, it's

PRD

THE STANDARD OF COMPARISON IN

Agitated by many new ingredients, the FRD line of RSP Test Equipment recently added a complete line available covering the entire frequency range from .01 to 40 kilocycles per second. The units listed indicate the wide diversity and applicability of FRD equipment. In addition to the standard line, FRD operates in the design and manufacture of special equipment to meet special requirements. A skilled staff of engineers is available to analyze your requirements and to assist in the application of standard or special components to your test problem. FRD equipment is required and known for its performance in the design and manufacture of special equipment. It makes this equipment the finest available anywhere with the result that FRD equipment is now used in leading laboratories all over the world.

FREQUENCY MEASURING DEVICES

Frequency Batters	Penetration Depth (mm/year)	100- 80%	100- 60%	100- 40%	100- 20%	100- 0%
General Purpose	0.47-0.73	104	0%	0		
	2.73-2.88	374	2 x 1			
	6.00-10.00	210-A				Detached (isolated)
	0.15-0.20	870	1 1/2 x 1/2			
	0.05-0.10		1 1/2 x 1/2			
	0.1-0.2	343-B	1 x 1/2			
	0.3-0.10		1 x 1/2			
	0.2-1.0	564-B	1 1/2 x 1/2			
	0.2-1.0		1 1/2 x 1/2			

[illegible]

SIGNAL SOURCES AND RECEIVERS

Item	BASIC DATA
BURN INCIDENTS	
Type T01	See type T0200 Mylar film, 2.400 ± 0.010 mm / in
Type T00	See type T0200 Mylar film, 2.400 ± 0.010 mm / in, 1% to 5% overage
Type T02	See type T0200 Mylar film, 2.50 ± 0.010 mm / in, 5% to 10% overage
QUALIFIERS	
Type Q01	Carrying the frequency range from 7.0 to 10.0 kHz/sec
Type Q04	Carrying the frequency range from 0.0 to 7.0 kHz/sec
POWER OUTPUTS	
Type P01 uk	Providing all complete test loads capable in a variety of media variety of Mylar film, plus internal modulation.
UNIT/INCH ANALYTICS	
Type U20	Carrying the frequency range from 1.40 to 2.40 kHz/sec
Type U04	Carrying the frequency range from 0.00 to 0.90 kHz/sec
Type U09	Carrying the range of the above ranges in 0.04 kHz/sec
DEFINITIONS	
Type D01	Carrying the frequency range from 0.45 to 2.00 kHz/sec
Type D03	Carrying the frequency range from 0.00 to 10.0 kHz/sec
Type D07	Carrying the frequency range from 23 to 900 mHz/sec
NOTE	
DEFINITIONS	
Type D04	See the internal modulation of media films in the range of 10 to 1000 mHz/sec

QUALITY. ACCURACY. DEPENDABILITY.

TRANSDUCER UNIT UNIT

[illegible]

TRANSMISSION LINE COMPONENTS

Wormholes in Kardar's category	201	207	234	235	234			
Isolated Tunnel/Pass	109, 100 205, 202	90, 100 211, 193						
Woodward Complex			400	408	401	402	405	
Myopodite Shoof		575	574	575	574	575	567	570
George Kirk and Jack Acumtallia	110	104	104	104	104	104	104	104
Isolated and Isolated						407 403	407	407

IMPEDANCE MEASUREMENT AND TRANSFORMATION

[illegible]

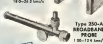
DETECTION AND POWER MEASUREMENT

Source: Bureau of Economic Analysis	1972-73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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BIOLUMINESCENCE

TYPE No	FOR USE WITH	TYPE No	FOR USE WITH	TYPE No	FOR USE WITH
410-A	210-A, 212-A, 413	420-A	412	430-A	421
414	216, 217, 416, 421	430-B	416	431-A	427
417	212, 419, 420	430-C	423	431-B	429

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B-47 Stratojet in flight

B-47 Stratojet in flight

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In one day of flying, surveyors and engineers accomplish work that once took months.

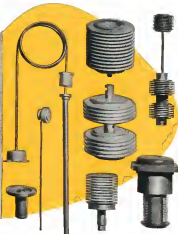
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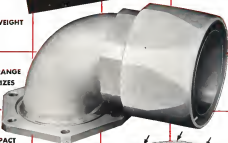

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Self-Aligning Torque Tube Type Bearing

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Specifically designed for large applications and push-pull controls on modern high speed planes, the new Fafnir torque tube type, external self-aligning ball bearing, provides friction-free rotation when wing sections and other members are deflected.

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Working with aircraft designers to solve this problem is another example of the Fafnir "outside and upside" ... a way of looking at bearing problems from the designer's viewpoint, and adapting the bearing up with the right bearing to fit the need. The Fafnir Bearing Company, New Britain, Connecticut.



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IMPORTANT FEATURES

- Designed to meet U. S. Air Force Safety Specifications MIL-STD-2757
- Patented Connectors ... Six-pin, double-throw design
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Immediately available to prime suppliers and sub-contractors of military aircraft equipment, the new RCA-205W1 DC Relay is designed for general use throughout the electrical systems of military aircraft.

Back to operation under street service conditions, and in any mounting position, the RCA-243W1 will provide longevity of service under extremes of temperature, humidity, shock, vibration and voltage variations. Be-

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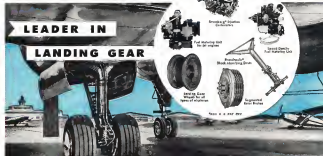
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They FIT... in every respect. That's why STRATOPOWER hydraulic pumps are so widely specified by design engineers and performed by operational personnel.

Today, a selection of several basic STRATOPOWER pump types, in both constant and variable delivery models, blankets the diversified requirements of modern aircraft hydraulic systems. And, there are two distinct types of integral pressure regulators available... with modifications to provide both electrical and oil-filled means for automatic or selective pressure control.

Both direct engine driven and electric motorized units are furnished in capacities from one-quarter to ten gallons per minute at a constant speed of 1500 rpm with continuous working pressures to 3000 psi. The maximum continuous duty operating speed is 3750 rpm, with a maximum of 4500 rpm allowable for intermittent operation.

Proven by exhaustive laboratory and extended service experience, STRATOPOWER hydraulic pumps continue to set new standards of performance and dependability for the aviation industry.



Hydraulic Division

THE NEW YORK AIR BRAKE COMPANY

HYDRAULIC PUMPS FOR THE AVIATION INDUSTRY

VARIABLE DELIVERY—POSITIVE DISPLACEMENT TYPE...Pumps in this series incorporate a positive pressure return system and were designed to meet new specifications calling for higher pressure performance. The design ensures adequate pump frequency under all conditions to provide fluid circulation for cooling and lubrication during the time from full pressure rise to isolation where one of more pumps are metered in a single circuit the positive pressure characteristics of these pumps eliminate the necessity of priming valves and independent pump priming.

**SERIES
66W**

CONSTANT DELIVERY TYPE...Used in conjunction with open center systems having relief valve over pressure protection, or in any closed center system provided with an accumulation and unloading valve. Constant delivery STRATOPOWER design, these units are the most responsive pump type with running cost and fluid efficiency. Mounting position and direction of pump rotation is optional without internal clearance and without wear-changing part conversion.

**SERIES
67**

VARIABLE DELIVERY—SUCTION CONTROL TYPE...This series encompasses the most direct known method of integral maximum pressure regulation. A pressure loaded pilot valve reacts against an adjustable calibrated spring to vary the amount of fluid admitted through the suction passage in relation to system pressure demand. Characteristics of all STRATOPOWER pumps, variable cylinder diameter and pressure relief closure at each cylinder end insure precise pressure setting and pressure drop maintained up to altitude when other pump types require pressure maintenance.

**SERIES
67V**

VARIABLE DELIVERY—INTERNAL BY PASS TYPE...Pressure regulation incorporated in this series of pumps is accomplished by means of a built-in reduced effective pumping under. These models automatically maintain constant output against maximum regulated pressure, cooling and lubricating circulation being maintained by recirculation action and delivery to the pressure vessel. Internal waste supply of excess leakage. Because of non-spool design of regulating parts, the pumps maintain, and positively adjust delivery, to the demands of the circuit.

**SERIES
67W**

VARIABLE DELIVERY—DUAL PRESSURE TYPE...This series meets all the variable delivery call requirements in terms of the fluid flow, pressure, low pressure, free flow system. This design provides two ranges in which the pump operates, chosen selectively for one operating or disengaging of the control or pilot line in the pump. An electrical modification of this series provides means for "backflow" in the regulating device during the same flow in the hydraulic system thus permitting the pump to operate under no load during periods when pressure is not required in the hydraulic system.

**SERIES
67MW**

ELECTRIC MOTOR DRIVEN UNITS...These units are used in secondary hydraulic circuits or where it is desirable to have the action of remote cylinders or remote from the engine engine. Models are furnished complete with AC and DC motors for both continuous and intermittent duty operation. Most features are available, individually designed, in motor combinations of electric motor characteristics and pump types.

**SERIES
167**

The New York Air Brake Company, through its affiliate companies, is a major supplier of high vacuum and hydraulic equipment extensively used by aviation divisions of the armed services.

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- **HYDRECO DIVISION**—Hydraulic Motors, Pumps, Valves and Cylinders for Materials Handling, Food and Construction Machinery.
- **YONKAT MANUFACTURING COMPANY**—High Vacuum Pumps and Equipment for High Altitude Test Chambers, Evacuation of Cylinders and Atomic Diffusion Vessels. Also Heavy Pumps for handling Blast Gases, High Pressure Fuel Oils, Brake Water and other materials on Trains, Barges and Floating Docks of the Navy.

CHATHAM

ELECTRONIC TUBES



TYPE VC-1367
Maximum rated peak-to-peak voltage 1000 volts. Average peak-to-peak current 100 ma. at 400 cps.



TYPE 3246/1738
Hydrogen filled tube with maximum rated peak-to-peak voltage 1000 volts. Average peak-to-peak current 100 ma. at 400 cps.



TYPE 3246/1707
Hydrogen filled tube with maximum rated peak-to-peak voltage 1000 volts. Average peak-to-peak current 100 ma. at 400 cps.



TYPE VC-1336
Maximum rated peak-to-peak voltage 1000 volts. Average peak-to-peak current 100 ma. at 400 cps.

Hydrogen Thyratrons

—for Pulse Voltage Generation

ELECTRICAL DATA*

Type	VC-1336	3246/1707	3246/1738	VC-1367
Maximum Peak Forward Anode Voltage	1000 volts	1000 volts	1000 volts	1000 volts
Maximum Peak Anode Current	100 amps	100 amps	100 amps	100 amps
Maximum Average Anode Current	0.85 amps	0.85 amps	1.0 amps	0.8 amps
Maximum Heating Power (W)	1.5 watts	1.5 watts	1.5 watts	1.5 watts
Normal Filament Power	12.5 watts	95 watts	100 watts	200 watts
Hydrogen Reservoir	No	Yes	Yes	Yes

*Data subject to change without notice. All dimensions are in inches unless otherwise specified.

is a new concept of hydrogen thyratron design! The tubes do indeed represent a departure from conventional hydrogen thyratron design and are a result of extensive work of our research and development staff. They are primarily employed in the generation of peak voltages with frequencies in the order of microcycles.

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CHATHAM specializes in the development, design, and construction of custom-built electronic equipment to exactly meet customers' requirements. Our complete line of equipment will handle your problem as desired. Call or write today.

Pulse to test equipment built by CHATHAM checks out your pulse conditions.



30 Megawatt Hydrogen Thyratron. Two Equipment built by CHATHAM to customer specifications.

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AND EQUIPMENT

Electronic Tubes



Rectified Type Tubes

The following tubes are JAN approved and are supplied primarily through direct from stock.

5B4WG1 2021W
6AL5W 0C3W
6H6WG1 0B3W
2526WG1 2050W

TYPE 325-A COLD CATHODE GAS TRIODE

Requires no filament supply and is used in many grid-controlled rectifier and relay applications. Maximum D.C. anode current 10 ma. Maximum D.C. anode voltage 150 volts.

TYPE 4832 RECTIFIER

A rugged full-wave X-ray filled rectifier. Operates in any position throughout an operating temperature range of -75°C to +100°C. Filament 3.1 volts, 1.0 amp. Anode peak-to-peak voltage 3500V, average anode current 1.25 amps.

TYPE 396-A THYRATRON

A Mercury vapor and Argon filled thyratron for grid-controlled rectifier action. Operates over wide ambient temperature range. Heater 2.5 volts, 52 amps. Anode peak-to-peak voltage 3500V, average anode current 640 ma.

TYPE 3828 RECTIFIER

This rugged full-wave X-ray filled rectifier will operate in any position and throughout an operating temperature range of -75°C to +100°C. Filament 3.1 volts, 1.0 amp. Anode peak-to-peak voltage 1600V, average anode current 1.25 amp.



TYPE 710-A HIGH VACUUM CLIPPER 500E

This tube is used primarily in clipper diode service in hard tube condenser circuits. Filament 1 volt, 2 amps. Anode peak-to-peak voltage 1200V, D.C. anode current 30 amps. Max. anode dissipation 25 watts.



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I.D.	.00	.00	.00	.00	.00	.00
W.D.	.00	.00	.00	.00	.00	.00
Wt.	1.00	1.50	2.00	2.50	3.00	3.50

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I.D.	.00	.00	.00	.00	.00	.00
W.D.	.00	.00	.00	.00	.00	.00
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Wt.	1.00	1.50	2.00	2.50	3.00	3.50

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W.D.	.00	.00	.00	.00	.00	.00
Wt.	1.00	1.50	2.00	2.50	3.00	3.50

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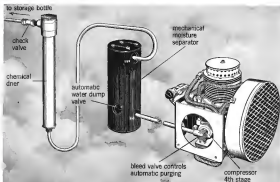
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EQUIPMENT



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Four of the five relays shown are variations of the same basic relay structure—the CLARE Type "R"—which is characterized by unusual sensitivity and extremely long life. It is an ideal combination of the very real advantages of a telephone-type relay with the small size, light weight and high resistance to vibration needed to meet the rigid requirements of aircraft service. It is but one of a number of basic relay types available in aircraft designs.

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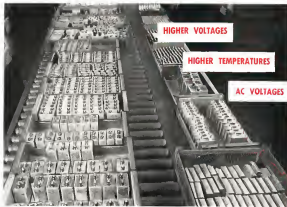
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WRITE FOR CATALOG AND BULLETIN 714

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Higher voltages—1500 v d-c at 35 C for 500 hours,
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This revolutionary d-c motor is completely self-contained. No ducts or other external ventilation equipment is required. Special flame arrester design provides complete protection and permits continuous-duty operation... with only a slight increase in weight over corresponding open, self-ventilated motors.

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pounds. They are available with standard AND mounting pads or with special mountings. Radio noise filters are installed. This new design has been explosion-proof tested according to USAF specifications.

Look into this new motor. Call your nearest Westinghouse Office or write Westinghouse Electric Corporation, Aircraft Department, Lima, O.

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AVIATION
EQUIPMENT

SPECIFY *Dura-Loc* for HIGH TEMPERATURE LOCKNUT PROBLEMS

Whenever the need for a specialized fastener arises, Delron's pioneering research and ingenuity meet the challenge. As a result, Delron products proved to be an outstanding contribution to the aircraft industry where high temperature and severe vibration present a threat to sustained performance of various assemblies. Special design characteristics of Delron products make for easy installation and removal in difficult locations... saving maintenance productive man-hours. Further savings are provided by the unlimited availability of Delron locknuts... without impairment of locking action.

DURA-LOC 1200 and 1800 High Temp Nuts were the first self-locking nuts approved by the military and industry for temperatures up to 1200°F and 1800°F, respectively. From a standpoint of efficiency and engineering design, Dura-Loc High Temp Nuts are the most recommended to use whenever critical high temperature fastening problems must be solved.



DURA-LOC FEATURES

- Customized accurately with various thread forms
- Positively locked when tightened
- Free spinning before and after removal without spin off
- Locks without any special torque, preventing damage to the assembly
- Designed to permit removal in guiding and removal
- Breaks easily... just apply air and high torque to break the lock
- Positive lock or stud threads
- Break proof in standard through hole or stud



Delron's Self-Locking Nut, Washer, Stud, etc., are designed with gas melting break control.



Delron High Temp Nut designed especially for aircraft service and ground.



Delron Flange Bracket. An effective support for vibration in aircraft type structure.

Delron's Self-Locking Nut, Washer, Stud, etc., are designed with gas melting break control.



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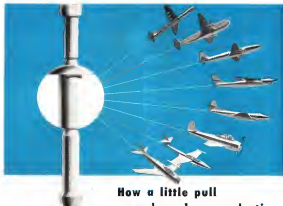
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Cherry Blind Rivets represent one answer to the 10,000 types of fasteners

manufactured by Townsend to fabricate wood, glass, plastics, fabrics, and metal products. From this wide selection, Townsend engineers are able to provide you with almost any standard cold-headed fastener or part to help speed assembly—improve your products. They will also help design special fasteners for your particular need. For information on how you can benefit from their broad experience in solving your production problems, write today.

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AVIATION WEEK

VOL. 57, NO. 5

AUGUST 4, 1952

Pilots Elect Officers of New Airline Union

- ATPA seen as a legal countermove to Behrcke.
- Sayen expected to head new organization.

Airline pilots demoralized with the leadership of David L. Behrcke, long-time president of the Airline Pilots Assn., were trading softly last week with plans for a separate union.

Their attitude was one of "wait and see" until they learned the result of their appeal from a Chicago court order restraining Behrcke, and support for a stay of that order (Aeronautics Week, July 28, p. 50). Behrcke's answer to the petition was filed last week.

Officers Named—Preliminary plans for the new union were going ahead, although cautiously. A new Air Transport Pilots Assn. was started by pilots representing each of the airlines. Officers at president and executive vice president (the latter to be succeeded by the president) were not filed (pending developments), but some officers were elected and the report was that further developments might come later in the week.

Officers named: W. T. Bobbett, Eastern Air Lines, first vice president; Ralph N. Buck, TWA International division, secretary; E. A. Cetrick, American Airlines, treasurer; and the following regional vice presidents: E. E. Pennington, AAL, Boston, second; Gustaf Leason, Pan American World Airways, Miami; and Mel Swenson, Northwest Airlines, Minneapolis. Fourth, W. T. Bums, Braniff Airways, Dallas, and John Deane Russell, Southwest Airways, San Francisco.

Political Committee—Headquarters of ATPA were to be established in New York instead of Chicago, ALPA headquarters. Clarence M. Sayen, who succeeded Behrcke in the resignation that followed Behrcke's ouster a year ago, was in line for ATPA's presidency after the court dispute was resolved and if the new organization actually became active.

The ATPA officers would constitute a provisional executive committee to govern ATPA until the new group could hold its first convention and elect its officers.

The ATPA officers would constitute a provisional executive committee to govern ATPA until the new group could hold its first convention and elect its officers.



SAYEN is new kind of new union if



BEHRCKE is old head of old union.

A spokesman for Behrcke called ATPA an "emotional movement," and said "more conservative" pilots were coming back to ALPA. Behrcke, ex-president of ALPA's Chicago headquarters, has called an ALPA convention for Dec. 8, but some of the dissenting pilots pointed out that the date is in the midst of storms of a new kind and they questioned whether the call would stand.

Flight Costs—Behrcke's first step after his return, the spokesman said, was to organize the pilots, the officers and the Median Board that govern ALPA.

contracts would continue in effect. Seven facts that the contracts are legal.

Whatever was to happen, the litigation over ALPA leadership was turning out to be expensive. Lawyers' fees already have amounted to \$120,000. There were other high costs, including detection and a cost reported elsewhere at \$17,000 a year to see that ALPA lived up to terms of various agreements while the case was pending. And the cost of the court decree restraining Behrcke and that on account of an appeal costs and fees would go on as long as the appeal was pending.

Way Clear for Supersonic Bomber

Official Air Force confirmation of production plans for the Strategic Air Command's Intercontinental Command B-36 heavy bomber in 1954 is expected to clear the way for the new plane to go ahead on its next bomber development, a supersonic jet, in which it already has substantial development.

Although planned performance of the supersonic bomber is highly classified, official sources predict it will be more than a match for any interceptor in production during 1955-1960.

This is an interpretation of USAF Headquarters, Ronald L. Gelpert's statement to Congress officials that "all essential work will be scheduled

into the plan. The workload there, it was said, was a certain to be increased."

The B-36 phase-out plan is expected to apply to its existing eight jet B-60 modifications. Only two B-60s have been built and no more are expected to be produced. Some consideration has been given in official circles to converting the 10 old B-36s (including remaining orders to B-60 configuration) that Air Force sources said that would be no more in use of the relatively small number to be built.

Although no actual flight evaluation of the B-60 and its rival, the eight jet Boeing B-52 Stratofortress, has been made, Air Force sources say the B-52's

Special Report on Air Materiel Command begins on page 74.

performance expectations for over half of the B-62. Present production of the B-62, done usually in increments of 10, is only at the start of its potential. For example, greater speeds at higher altitudes are expected with refinement of more powerful engines than the Pratt & Whitney J75, now fitted.

De Havilland Firm Offers Mexico Jets

(McGraw-Hill World News)

Mexico City—De Havilland's superbly built jet has offered President Miguel Alemán a wide range of jet planes for the Mexican air force and commercial jets for the nation's airlines, according to reports in the capital.

Observers noted that while Mexico's air force is antiquated and has no jet construction is being rushed on Santa Fe air field, a big military air base 70 mi north of Mexico City, with runways suitable for jet operations. Work is expected to be finished this fall.

Mexico visited the field recently and has general interest is believed to indicate that at least one group of jets will be added to the air force.

The firm that made the DHI offer, Compañía Mexicana de Aeroplano S.A., is owned by Héctor Mancilla and Santa Saura, Jr., both of whom belong to politically influential families. Reports are that the offer proposed either multibillion payments or straight barter to help Mexico acquire the planes with out requiring its budget.

Atom Engine Test Base

A \$35-million facility to test the nuclear powerplant for aircraft now under development at Lockheed (Boeing Co.) in the General Electric Co. will be constructed at the National Research Testing Station in Oak Ridge, Tenn.



NEW STINGER FOR SCORPION

This Northrop F-88 Scorpion has some type typically with not only some in midday but continues but also some a number of previously built jet-to jet.

Early Comanches has announced that preliminary work is close to completion, the atomic powerplant, which would open the way for almost limitless aircraft range, will be seen later at the test site.

The new facility will be the fifth nuclear testing project undertaken at Idaho in the past three years.

X-2 Rocket Plane Groomed for Tests

Bell Aircraft Corp.'s X-2 rocket-powered, supersonic research plane has been delivered to Edwards AFB, Calif., where it is preparing for supersonic flight tests by Air Force and National Advisory Committee for Aeronautics.

The new rocket plane, which has a K-Motor (Mitsubishi) and stainless steel wings and tail, is powered by a Curtiss Propeller-driven rocket engine developed by Lockheed, which is being flown in a sharply sweeping configuration in place of the straight wing configuration of the original Bell X-2 supersonic research plane. The X-2 is expected to reach speeds above 1,500 mph and to altitude of over 100,000 ft.

Air Force officials said the X-2 would undergo considerable ground testing before entering flight tests to determine.

But this, also pointed out that flight tests would be restricted to no more than 100,000 ft. in altitude of over 100,000 ft. in altitude to prove out the complicated control system before attempting rocket-powered flight.

An Air Force source said the X-2 will undergo the rocket engine test on an official speed record attempt by the Douglas-developed Navy D-558-2 Skowatnik which attained 1,200 mph at an altitude above 70,000 ft. The D-558-2, which generated greater speed, reached an unofficial speed record speed of "hundreds of miles per hour" better than speed.

He disclosed that presentation to AF by its acting chairman as "a discussion of numerous points contained in a staff paper" prepared by Campbell. Details of what Fowler called the "questionnaire" were first disclosed in Aviation Week, Feb. 25.

Douglas Fowler's letter to McNamara prior to that date, states the Bell-Campbell recommendations have been a key point to the industry and particularly the Air Force and Navy. AF officials include the Air Force and Navy charged with production and procurement of U.S. as power, but the military service have been careful to point out that the recommendations came only from Campbell and did not have the status of an official AF report despite Campbell's executive authority.

Both AF and Navy were continuing work, however, on their staffs to Campbell's proposals, and observers speculated that time for the reply was extended to permit extensive study of the whole production problem. In the meantime, no action on the review regulations was expected.

More Time

- Answer to proposal for production shift delayed.
- Services now have until September to reply.

Recommendations by a high official of the Aircraft Production Board for a complete shift in the U.S. aircraft plane production program at the expense of some existing types have been tabled until mid-September.

Military members of APB also gave their view on the shift in the early 1950s, set for Aug. 6, by which they are to reply to proposals by W. L. Camp, chief, acting chairman of the board (Aviation Week, July 28, p. 12).

But the shift in the Air Force and Navy was both conditioned and limited. Some top military and industry officials considered the recommendations would deprive the production program of the ability to plan ahead, and military officials also considered the shift would deprive the military of a more realistic program.

Campbell's action was clarified by the Defense Production Administration, at which APB is a part. DPA Administrator Henry T. Fowler said Administrator David C. Barnes, president of the Aircraft Industries Assn., that Campbell's presentation was a question asked by one member of the board for comment by other members representing the military services.

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New Eastern Route Interests Mexicans

(McGraw-Hill World News)

Mexico City—Speculation and curiosity here greeted the news that East Air Line has been granted a long-haul route between New Orleans and Mexico City.

Previously the Mexican government granted Eastern the route, after two years of study, because of the transit business it would bring.

But some observers are pointed questioning behind the move. They are worried about the fact Eastern's request was frustrated by high officials of competing lines who at one time called the flight all the way to the Mexican president before defeating it.

Eastern has announced it will begin operation of the new route, which had been approved by CAB six years ago, as soon as possible. It built a brand new line leading several times as fast as the old line, and has kept a well kept eye on the move, as it is believed the new daily flight can begin shortly.

An EAL spokesman says that operations were only running of a suspended Mexican carrier.

Big Question—Eddie Rosenbly, Eastern president, has said the route will be opened as soon as further details are strengthened out on the United States end.

One big question raised here is whether Eastern will offer a one-stop service no change of plane, from Mexico to New York. This would cut sharply into the business previously split between American Airlines and Pan American.

If Eastern offers such service, and then opens likely it will have the most direct route from New York and Mexico since Pan American's transition to Eastern at Houston. But New York and American has via Dallas.

Thus it is believed Eastern could cut heavily into business originating out of the Midwest, but not to the West Coast and the Middle West.

Another argument is that transit between New Orleans and Mexico City will be a loss.

Some Red Tape Cut On Bids for Mail

Legislation removing the requirement for submission of bids for transporting mail including air mail has been signed by the President. Civil signal statements will be necessary.

The Postmaster General requested the legislation, pointing out that the change will eliminate red tape but will not affect bidders.

INDUSTRY OBSERVER

High reliability factor for the Comet engine steel leading gear is shown by the fact the company has had only one failure of the gear out of a total of 25,000 individual shafts in service. Comet straps a small window in each of the stainless steel lugs and keeps a host (not seen) on each for checking in case of trouble.

Most likely small jet engine proposal for the TX jet trainer competition, from a standpoint of weight, power and other factors, is the West German Continental model will build under license from the French Turbomeca Company.

One problem Boeing has encountered with its B-47 Strategic bomber is in making runway doors. It is under varying conditions of temperature encountered in the high altitudes and the various attitudes the wing takes in loaded and unloaded condition. Solution to this problem involves a winging design for the doors as they are slung under tension to make a wing fit.

Long Line is taking up serious interest in transport-type order and may enter the field. Line is offering to finance hundreds of initial sales development costs at interest will provide balance. Negotiations between another aviation manufacturer and a major airline interested in buying more are reportedly stymied over whether airline or manufacturer should buy the initial cost.

Some West Coast sources say Lockheed's P-90C Starfighter intercepter still has its problems in the air as the new management for rocket drive in concerned. The rocket's duration so much exceeds the life of the gas in the ramjet's vicinity of the engine which the P-90C engine has a tendency to flame out, some a dozen miles and is caused by the rocket that the pilot usually has time to get out of the wake of the rocket.

Howard Hughes has leased the prototype Convair Aerojet for high speed aircraft development tests. So far the plane is in short lease but with extensive options. Hughes Aerojet officials say the test program is not sufficiently advanced to determine whether the Jetstream will be suitable for long-range tests. Reason that Hughes might seek more for Aerojet production were stretched by the company. Officials on the X-15 helicopter is the last of its aircraft vehicles that the company will consider further as a development.

A military transport version of the B-26C is on the drawing boards, along with sketches of a Vulcan variant jet transport. And it now appears that the British Air Ministry will place a civil order for Blackburn & General Can. 60 Mark II fighters.

Boeing Skyliner II prototype, with about 7 deg. more wing in wing than its predecessor, is powered with Supracraft. Boeing Skyliner hopes to make the Skyliner standard in the Market sector, but the first to go into service possible will be preceded by Avro.

Future plans of the Pioneer Helicopter Corp. include two new versions of the giant H-16, the XH-16A powered by a gas turbine engine and another proposal which would make a 10-passenger transport out of the big carrier. Pioneer also has schemes for multi-engine versions of the H-16 and H-17 which could be fitted at the end of current production runs of both types.

Russian night-flying activity in the East German zone has increased considerably in recent days, according to German sources. But NATO-11 fighters and the two F-105s in a new version have been observed on night missions. The F-105 nightfighter model now accounts the industry in the night fighter nose and carries a pair of missiles on either side of the nose.

NEWS DIGEST

Domestic

"Flying squirrel" reports are being received by USAF at the rate of 100 monthly, and all are being investigated. Recent flurry of "radio sightings" is attributed to radar's well known habit of picking up reflections from cars, buses, weather fronts and other natural phenomena. Only about 100 reports of sightings from "radioable" aircraft, says USAF, and it keeps being concerned about them.

Newly appointed CAA Assistant Administrator Kenneth A. Knap will supervise administration and management operations. He has been with CAA 17 years, serving as Assistant Regional Administrator, Atlanta, Ga., from 1946 to 1949 and as Deputy Regional Administrator, Kansas City, Kan., since then.

Frank F. Rowell, Sr., president of Gaussian Electric Mfg. Co., died July 1, at his summer home in Lakewood, Calif. He, 61, was the age of 75.

Colonial and Eastern Air Lines jointly filed an application with Civil Aeronautics Board for approval of merger agreement under which assets of Colonial would be transferred to EAL through exchange of two shares of Eastern stock for three Colonial shares. Colonial stockholders will meet next month to pass on the agreement.

U. S. reports of mail aircraft sightings, 6,800 in or less totaled 31 each during June. The planes, delivered by five firms, were valued at \$173,510. This broken into eight requests total to 179 small planes valued at \$1,326,128.

New flight patterns have been established at Wheeling County Airport following complaints by nearby residents.

Boeing Airplane Co. involvement at Seattle and Renton, Wash., plants has reached previous peak of 10,000 and is scheduled to attain 35,700 each by end of this month.

Richard W. Hanson, director of public relations and advertising for Glenn L. Martin Co., has joined T-1 & Karolinska, Inc., public relations firm, as a vice president. Albert E. Simon, formerly of American West and more recently Thermo's assistant, is new Martin public relations manager.

Herbert O. Fisher, previously executive director of Corporation Aircraft

General Corp., Washington, D. C., and earlier with Corbin-Wright Corp. in engineering, flight test, public relations and sales, has joined Post of New York Authority as chief of the Aviation Development division of the Aviation department.

Passage was blown out of FAA Region 10's office when, after about a week, the plane was found at about 13,000 ft. near the coast of northern Brazil on July 27. Search planes were unable to locate the body. Plane had taken off from Rio de Janeiro and was on its way to Montevideo, Uruguay.

Nutting P-49 Scorpion will suffer interference from being assigned to Fort Benning, Ga., at Griffis AFB, Rome, N. Y. and Presque Isle AFB, Me.

Intention closing losses totaled \$16,104,700 in airline transactions during June, a 23.7% increase over the same month in 1951.

Financial

Northwest Airlines reports net profit of \$436,000 in June after provision for taxes. Total operating revenues during the month were \$5,182,560. Due to fuel curtailment and spare losses, NWA ended first half of this year with net loss of \$524,946 after taxes.

United Air Lines shows net earnings of \$3,751,961, after taxes for the first six months of 1952, on operating revenues of \$72,785,651.

Aerograph Corp., Encino, Mich., netted net profits of \$26,167 on sales of \$13,585,946 for the nine months ended June 30.

International

USAF-Rearm placed about \$100 million in contracts abroad during the first six months of 1952. Total offshore procurement contracts placed by U. S. armed forces in Europe during the period were approximately \$684 million.

People Airways C-47 intercity flights into the Mediterranean last week when one engine failed. All 39 passengers and four crew members were rescued.

Canada's LSA, Montreal, has received Ford Motor Co. of Canada's contract to make a new T-33 jet bomber, reportedly because of labor difficulties in the Ford plant.

Increased Titanium Production Okayed

Shipyards in U. S. titanium production facilities were authorized last week in an agreement between Defense Materials Procurement Agency and E. I. du Pont de Nemours and Co., calling for production of an additional 13,500 short tons of titanium each year. The Post facilities at Newport and Edgewood, Del. The production will be three times the company's present production capacity (AVIATION WEEK July 14, p. 15).

DMPA Administrator J. L. Lanza said the government was adhering to its Post up to \$147 million for expansion of its facilities, to be repaid with interest in mobile titanium, usage as produced from the additional facilities.

In the event improved production methods may obsolete the production facilities provided for in the agreement, the government has agreed to take possession of the additional facilities, and were required of their current cost less depreciation and amortization.

Speculations are that more economical methods for producing titanium ore into metal will be developed, but Lanza pointed out that the need for more titanium was urgent and could not wait for such processes to be perfected.

DMPA has a similar agreement already with Titanium Metals Corp. of America, Henderson, Nevada, for production of 15,000 tons of titanium sponge over a five-year period. Only pilot plant quantities of titanium were produced in this country before Korea, but output of the metal for aircraft engines, tanks, ships, armor plate and other military equipment has boosted its requirements above the small supply now available.

Lycoming Developing Turboprop Engine

Lycoming-Spacor division of Aero Mfg. Corp., has entered the aircraft gas turbine engine field with award of a contract by USAF for a turboprop powerplant. No details of the new engine being developed by the Williamsport, Pa., maker of light and medium aircraft powerplants, were given.

Work on the new project is being directed by Dr. Andrew Frost, head of Lycoming's aircraft engine development division during World War II when he had charge of the Jumo 204 turbojet engine that powered the ME-262 rocket fighter and other German jet planes. Prior to his present position Dr. Frost was with USAF as a consultant on jet engines at Wright Field on AFM Division O.

Money to Spend:

\$22.9 Billion—and AMC Will Spend 80% of It

AMC will have the job of spending about 80% of Air Force's record peacetime budget for fiscal 1953. AF's budget for the year, which started July 1, is \$22.9 billion. Last year it was \$22.7 billion. Budget highlights:

• It provides for orders for 6,410 new aircraft and for completion of financing of 1,163 of 7,610 aircraft

which were ordered during the last fiscal year.

- It contemplates buildup in military personnel from 973,350 to 1,061,000.
- It provides for a sharp boost in funds for research, development and guided missiles.
- It continues the apportionment, since Korea, of funds for aircraft procurement.

	Fiscal 1952 Appropriations	Fiscal 1953 Appropriations
Aircraft and Related Procurement.....	\$11,882,500,000	\$12,685,044,000
Including:		
Complete aircraft.....	4,823,223,804	6,567,238,617
Spares and parts.....	4,020,584,176	3,290,204,236
Related aircraft procurement.....	1,919,936,649	645,811,147
Major modifications and modernization of aircraft.....	207,074,400	116,000,000
Guided missiles.....	130,000,000	300,000,000
Industrial mobilization.....	9,300,000	5,706,000
Administration.....	62,424,000	72,000,000
Contract liquidation.....	625,000,000	1,891,044,000
Major Procurement Other Than Aircraft.....	1,775,000,000	900,000,000
Including:		
Electronics and communications equipment.....	422,908,799	400,000,000*
Training equipment.....	139,361,139	60,000,000*
Acquisition and Construction of Real Property (on liquidate contracts).....	85,000,000	45,334,770
Maintenance and Operation.....	3,209,442,000	3,600,000,000
Military Personnel.....	3,816,700,000	3,200,000,000
Research and Development.....	425,000,000**	\$25,000,000
As follows:		
Aircraft.....	74,327,000	74,071,000
Guided missiles.....	116,072,800	110,181,000
Propulsion.....	69,003,000	96,677,000
Electronics.....	54,624,702	68,097,000
Armament.....	35,556,000	45,507,000
Equipment.....	41,149,000	42,917,000
Secrets.....	63,884,300	64,411,000
Special projects.....	74,477,470	76,545,000
Laboratory agreement.....	5,869,000	6,694,000
Reserve Personnel.....	10,043,000	26,196,000
Air National Guard.....	87,900,100	896,000,000
Contracting.....	46,600,000	30,787,000
Public Works.....	2,260,000,000	1,812,857,000
TOTAL, AIR FORCE.....	\$22,740,985,000	\$22,981,218,000

*May be reduced because of congressional cut in \$500,000,000 in one-off allocations for major procurement other than aircraft, from \$1,300,000,000 asked by USAF.

**From under \$100 added up to \$415,317,262, the \$475,000,000 figure in the table does not include transfers from other accounts and prior year funds available.



WRIGHT-PATTERSON AIR FORCE BASE



This Is the Air Materiel Command

HEART OF THE U. S. AIR FORCE is the Air Materiel Command Headquarters pictured above sprawling across 7,400 acres near Dayton, Ohio. It furnishes logistics support for USAF, and for foreign forces using U. S. aircraft.

Because of the size of that job, AMC has become the world's biggest business.

AMC spends more money than any other single organization in the nation. To understand AMC, you have to understand that what it does, and how it does it is vital to all society.

"We have become so big a business," says Lt. Gen. E. W. Basch, AMC commander, "that our activities affect the national economy of the nation."

This is not merely a military man's routine assurance of how important his job is. In the case of AMC it happens to be true. It is true, because of the way AMC fits into the national economy, because of what it is doing and must accomplish—why it does it.

The Air Force receives the largest appropriation of any of our military services. Its total for procurement—

the month it spends in industry—is the largest: \$16.5 billion in the fiscal year just ended; \$12 billion in the year ending next June.

AMC spends that money. And the management of that spending makes AMC important in the national economy. It is trying to manage the spending more effectively through a sweeping reorganization.

Its success or failure can start or end inflation; raise taxes or hold them at present levels; give the nation an effective defense or render it helpless.

Costs of aircraft and equipment have been creeping about 3% annually for the past two years. The aircraft program was stretched out because defense was coming so much that it endangered the national economy.

If AMC's long-range reorganization plan works it will give the country an adequate air force and a strong national economy, at the same time by keeping costs down to a level the country can afford to pay.

That is the condition of a special staff of AMATCOM, WPA which for two months talked to hundreds of people and pored over stacks of documents and files

—the Biggest Business in the World

to prepare this exhaustive report on the Air Materiel Command.

It is plain now that the key to understanding AMC is to understand the reorganization by which AMC hopes to manage its spending better in the interests of the nation.

Nature of the Reorganization

HIGH COSTS IN AIRCRAFT PRODUCTION are not inevitable, AMC believes. Plans can be made cheaper with no loss in quality by careful management control on expenditures.

Never before has the Air Force been so cost conscious. Two months ago, Gen. Basch told the annual gathering of AMC of West Point cadets: "A great many of the taxpayers simply do not believe that what is known as the 'military mind' is capable of cost-consciousness. We are going to have to prove that they are mistaken."

AMC wills are gladdened with such signs as "WPA is not a money job; you don't have to study it to understand it." AMC is extending the three—drawing the more thought into Air Force contractors.

AMC's entire reorganization is directed toward "More Air Power For Dollars." Because that is the goal as well as the guiding force, this reorganization is more than the reshuffling of jobs and people that contractors go on in government.

Cost savings stem only from better management. So, AMC's reorganization embraces a basic change in management and procedures such as the national department of the air arm never has known before. Its cost of arms would be a slide rule rampart as an electronic calculator.

BUSINESS MANAGEMENT techniques at AMC's word as its new crusade, and education its shield.

Gen. Basch takes pride in the fact that among the 604 officers is the Directorate of Procurement and



Area C, Patterson Field, and Area D, Wood City (left center) lie just to the east of Areas A and B (pages 74 & 75).

Production, the average level of formal education is 17 years.

A member of the Harvard Club in Dayton comments that it probably is one of the fastest growing clubs of its kind in the middle west. Most of the growth has occurred in the past year. Not odd at all, that corresponds with the tenure of Gen. Rawlings as commander of AMC. He is a graduate of the Harvard School of Business Administration with a master's degree in industrial management.

AMC is frank in prosthelyzing skilled administration and graduates of industrial management courses. The area, long a hard work, service to country, a desire to learn a new form of management, and pay not commensurate with industry.

May Gen. William H. Turner, deputy commander of AMC, not long ago told a meeting of the National Security Industrial Area, "We are getting a bad reputation for picking the bones of good men . . . the habit will grow steadily worse."

What is actually happening at AMC is the developing of a new science. It is not just the adaptation of industrial management to military science. It is the new beginnings of the science of military management.

AMC personnel and task groups from major industrial firms have thrashed out new doctrines and procedures, professors of industrial management have held seminars for AMC people. Business machines by the hundreds have been installed in the labyrinthine buildings of Areas A and B.

AMC officials are still open-mouthed in astonishment

at the performance of these mechanical brains, and nations are practically held in hostage until they have been thawed and thawed at the electronic word.

AN URGE FOR BETTER MANAGEMENT is at the root of all this. It starts at the top where Gen. Rawlings, dealing in a sphere he knows and understands, is making the AMC Comptroller's Office his management intelligence agency (page 116).

The Comptroller's Office distills the progress reports from AMC's many outposts and from manufacturers. This distillation is routed from AMC to the Pentagon. In this sense, the Comptroller's Office is the management intelligence service for the entire U. S. Air Force.

Management control flows incessantly from management intelligence. These controls, organized and directed by the AMC Comptroller's Office, are gradually pulling the center of all Air Force management into the Air Materiel Command.

When this is understood, it is apparent how AMC, by its influence on the commander of the Air Force, exerts a strong effect on the national economy.

Yet, business management techniques in national activities originated at the Pentagon rather than at AMC. In 1947 Arthur S. Brown, a former Sen. Roosevelt official and then Undersecretary of the Air Force, outlined the "bayer concept."

In simplest terms, this is the method of buying which makes one man completely responsible for a contract

This costates the work and speeds it up. As an example, in 18 months \$17 billion was spent by only 140 buyers or contracting officers and 300 assistant buyers.

The bayer concept means fewer lines of authority. The fewer these are, the easier they are to control. But under certain circumstances, and when not belabored by thorough and solid management reforms, a few lines can get dangerously long.

Reason for the Reorganization

AMC WAS FOUNDERING in a flood of dollars before the reorganization really got underway more than a year ago. The outbreak of war in Korea touched off the reform.

That was before Gen. Rawlings took command. Even before he moved in, the urgency of reform was known. Its broad principles decided. He has been the driver shift of a revolution.

The impetus to reorganization was simple expansion. Toward the end of June, 1950 AMC was spending the last of Fiscal Year 1950's \$2 billion in procurement funds. In the next year it had to spend \$11 billion. In the year just closed, the figure soared to \$16.5 billion.

In June, 1950, 4,000 people worked in procurement at AMC headquarters and in the field. Early this year the figure stood at 12,500.

Neither AMC nor any other organization could absorb such growth without stress. The difficulty was compounded because the AMC structure was a patchwork that had been put together through the years without a long-range plan. In its 1950 form it was incapable of smooth expansion.

Yet, the logistic heart of the Air Force had to continue pumping support to the Air Force units in the field even while the heart swelled. The initial motivation for the AMC reorganization merely was to accomplish that end.

The motivation came slowly but there was a more essential reason to reorganize. Reorganization was vital for management's sake alone—and for economy. AMC had become too big to be operated as it had been in the past.

"The mission of the Air Materiel Command is primarily aerial logistics," says Gen. Turner. "It is simple not an operation for amateurs."

A more detailed analysis of AMC's mission leads to the belief that neither is it an operation solely for business men.

LOGISTICS IS AN UNBUSINESSLIKE operation by its very nature. Time often is more important than dollars. A business creates national wealth. Military logistics spends it. The reason for business is profit. There is no monetary profit in military operations.

A business conforms to its own pattern, or the pattern of its competition. A military organization con-

forms to a pattern of politics, pressure and precedent.

AMC's difficulties in reorganization stem from attempts to apply business methods to an essentially unbusinesslike operation.

Business methods will work up to a point. And the directing basis of AMC would be the first to admit that complete business methods are impractical. But out of the attempt is emerging the new science of military management.

It will be a long time in attaining its full flowering. As changed as AMC is over a year ago (three new doctrines, a complete change in high command, downgraded procurement), the reorganization is just getting underway. Even while this issue was being prepared, changes took place which moved some of the charts.

The reorganization must be a step-by-step process. Too many conflicting factors make a speedy transformation impossible. As an observer digs deeper into AMC, he becomes convinced that efforts to reorganize the Air Materiel Command are compromised by geography, history and politics.

Geography vs. Reorganization

AMC'S LOCATION is an accident. Perhaps it would be more efficient if it were nearer the Atlantic coast on the west coast. Still, it is within a few hours driving time of the industrial center of America, within a few hours flying time of the political and financial center at Washington and New York.

But in other ways its location is not so fortunate.

The Air Materiel Command headquarters occupies 1,000 buildings on 7,400 acres in a shallow valley nine miles east by north of the center of Dayton, Ohio. It is split into four areas: B, Wright Field, nearest to Dayton, and the location of the procurement offices and the laboratories of Wright Air Development Center; A, four miles further along State Route 4, the site of the Headquarters Building, 202, C, Patterson Field and the headquarters of Wright-Patterson Air Force Base; and D, the military residential area known as Wood City.

Daily 35,000 vehicles move along Route 4 to and from Areas A, B, C and D and along the 100 miles of roads within Wright-Patterson AFB. Route 4 is a four-lane highway, divided only part of the way. The traffic and parking problem is of constant proportions.

To reach the main entrances of the various areas, cars and buses have to use Route 4. Unimportant in itself, yet basic to an understanding of AMC's troubles with geography, is the fact that a heavy snow cover unobscured the logistic heart of the United States Air Force for more than a day.

The line between Greene and Montgomery Counties slices between Areas A and B. Route 4 is channeled as a military highway. Each county declared responsibility for snow removal on a military highway, so did the state and the cities involved.

A series of such snow incidents can easily be compounded into a major crisis for AMC.

AMC IS THE LARGEST EMPLOYER in an 11-county area. It employs 15,000, and one-seventh of the annual payroll is the area comes from AMC.

Like all government agencies, it has been a steady employer. Material activities in the Dayton area now are more than 30 years old. Many employees at Wright Patterson AFB have deep roots in Dayton. And that also, is a factor in the future course of AMC.

Veteran employees are a source of both strength and weakness. Strength because you get loyalty and experience—even in government—does all employees weaken because such employees are bound to be the core of resistance to a change such as decentralization which transfers employees.

Decentralization, while impelled by strategic considerations (page 28), is a gulf point in the reorganization, according to AMC's managers. The reluctance of veteran employees to transfer will not stop decentralization.

But it will hinder it. It means AMC must train new people for the new locations of procurement, and suffer through the breaking period of the upheaval.

THE GEOGRAPHY OF DAYTON plays its own part in the resistance shown at work on AMC. An understanding of Dayton's topography leads to an understanding of another of AMC's troubles.

Dayton settles in a trough cut through the rolling hills of southern Ohio by the Miami, Stillwater and Mad rivers. In 1913 they flooded the valley, with a loss of 400 lives and \$100 million worth of property.

After the flood, the Miami Conservancy District was formed to build a series of dams as protection against future floods. Huffman Dam is one of the integral parts of the Conservancy project. Like a shielded site it cuts across the divide between Areas A and B.

But AMC headquarters and Patterson Field are downstream of Huffman Dam. In case of flood stage in the river, Huffman's three gates would be opened and a goodly part of AMC drowned.

And AMC is helpless. The Miami Conservancy District is privately financed and locally controlled. The federal government has no voice, except by avulsion, in what is done by the Conservancy District.

So AMC's location is not ideal for such an important component of the Air Force. The area has become congested through the years, and for greater efficiency the reorganization contemplates moving some of the activities elsewhere.

But the deep roots in the area of some key employees argue against the move.

For strategic reasons, much of AMC perhaps should be moved to a site with more suitable topography. But this would be entirely too costly and disruptive. So the reorganization has to be adapted to the present site.

AMC's location imposes limits on what the command does and how far the reorganization can go. To understand

what why, you have to understand some key factors in AMC history.

History vs. Reorganization

THE PAST IS AS POTENT AS THE PRESENT in any movement of what AMC is today. If AMC had never been assembled it would not now have to be assembled. If, through the years, activities had not been moved into WPAFB, they would not now have to be moved out.

History overrules USAF and AMC wishes in things both small and great.

USAF wants to change the name of the base to Wright AFB. But under terms of the grant of land to the government, ownership of all of Area C reverts to the Patterson family if that name is ever dropped.

That is a petty thing, perhaps. But it is typical of the area hand history has fastened around AMC. A more important outcropping of history is the heritage of AMC headquarters, which now is planning the reorganization.

AMC is located at Dayton because of circumstances now obsolete, not because there 113 square miles were the most suitable of all the 3 million square miles in the United States.

Stearns Station, now encompassed by Area A, was the first training ground for Army aviators. All activities naturally flowed there in later years. McCook Field, a few miles away, was established in 1917 for experimental work for the aviation section of the Signal Corps.

Fairfield Air Depot had been set up by the Signal Corps several months earlier on 10 acres of bought land. So in the same year, procurement and supply activities started in the same area. Those beginnings determined what AMC is today.

AMC'S TROUBLES WITH HISTORY began when Fairfield and McCook outgrew their quarters.

The air service of the Army was fighting for its life in the early Twenties. It few obsolete World War I planes because it had merely thousands of dollars, not millions, for procurement—and practically nothing for installation.

The Patterson family gave the huge undeveloped near Fairfield to the government for an airfield named in honor of Lt. Stuart Patterson, killed in a wartime crash. The owners of Dayton bought 6,500 acres of land a few miles south of McCook Field and gave it to the government for a new center of air material activities which was named Wright Field.

The Army Air Corps then had its new installation—at no cost to the government for land.

The financial indomesticity of the Twenties kept the body that now carries the Air Materiel Command. The hunger of youth led deformities that limit the pace of activities is maturity.



A jumble of buildings bordering the old strip of McCook Field (above) was the center of Army air material activities in the Twenties. Today, the functional simplicity of the Patterson Field operations building (below) is evidence of the change. Only direct flight activities are carried on at Fikek now. Material functions, that have grown at the Air Force has grown, are—like the Air Force—spread over miles.



Politics vs. Reorganization

THE MILITARY MIND, by inclination, avoids what its profession terms "political questions." But every action of the military managers of AMC is dictated by the influence of politics. But in trying to assess it as an understanding of AMC, it is necessary to use the dictionary definition of "politics."

Politics is the art or science of government, the forming and administration of public policies. AMC is a weather-vane spinning in the storm of public policy.

Policies of government have forced AMC to institute management reforms. The Comptroller's Office is an early understood example.

The Air Force needed better production progress reports and planning analyses. Costs were rising too fast and Congress, although convinced of the worth of air power, was becoming more searching than ever before in its questioning of the Air Force budget.

In those circumstances, the Air Force needed the management controls suggested from the Comptroller's Office to protect its own interests. At the same time, it was yielding to the demands of government policy for curtailment of unnecessary expenditures.

This happy blending of Air Force aims and government policy is an outstanding bit, by no means isolated example of the influence of politics on AMC's reorganization.

PROCUREMENT POLICIES are determined by politics. That does not mean revealing political advice or meddling with government contracts.

AMC is clear. "Procurement irregularities," as they are discreetly called at AMC, involved only 48% of total procurement initiated in fiscal 1953.

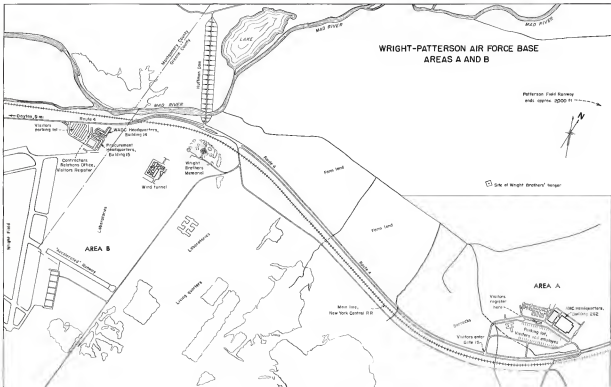
But politics prevails in many ways. It is government policy to prevent racial or religious discrimination in hiring workers for government contracts; to prevent cost-bidding based on three wages, to prevent excessive profits on work for the government.

These, and many more expressions of government policy, are written into procurement laws or procurement regulations (page 28).

In residential AMC, it is necessary to understand that the managers of AMC have to proceed within the framework of these laws and regulations—all written to further the ends of public policy.

If AMC cannot permit in its bidding steps toward the new science of military management; if in the end the entire shiny skeleton of the new AMC office is squeezed down into a jerry-built shack, politics—the art and science of government—will be in highly suspect as the architects of the new AMC.

The managers of the Air Materiel Command know that well. To understand what goes on at AMC, you have to understand that those managers appreciate their obligation to the taxpayer. The slogan "More Air Force For Dollars" is not a superfluous yell; it is a sign of a maturing sense of public responsibility.—William Koop

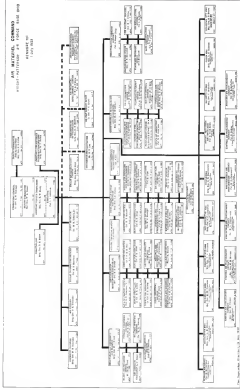


Procurement Dictionary

- **Interplant.** The act of an authorized agent of the government by which the government acknowledges and agrees that the supplier or service furnished by a contractor are in conformance with the contract as to quantity and quality.
- **Accessory.** A supplementary device used in conjunction with an end item, contributing to the effectiveness thereof without increasing or reducing the basic function.
- **Advance Payment Bond.** Bond securing performance and fulfillment of a contractual provision for the making of advance payments.
- **Advance Time.** Represents the time of the contract inception from the time, shipping time and lead time.
- **Assembly.** A unit of an end item can consist of two or more parts fastened together.
- **Attachment.** A supplementary device fastened to, or mounted on a machine, vehicle, apparatus or other end item to use or extend the function thereof.
- **Condition Item.** One without which the period date of plant equipment could not operate. Examples include the driving shafts and shafting link.
- **DBL Bond.** Bond which requires a bid in which the bidder obligated himself in an amount stated (the penal sum).
- **Consent Item.** An article designed for and available on the open market.
- **Construction Contract.** Any contract for the construction, alteration or repair of buildings, bridges, roads or other kinds of public property. It does not include any contract for the manufacturing, producing, furnishing, construction, alteration, repair, painting or decorating of such property or other kinds of personal property except the term of the work of new work contract to be present or file.
- **Contract Administrator.** The individual duly designated by appropriate authority in the nation departments to administer a contract.
- **Contract Negotiation.** Time Represents the time between the initiation of a purchase request for a requirement and a definite contract is made. It does not mean that a request expeditious action to place a contract to insure ready's production on a lead other than a definite contract work item. It does not mean that a contract is made; will not necessarily with the vendor's free time and a defective contract has been accomplished. But to the contract administrator (the vendor) as well as follow-up procurement the contract negotiation time becomes an integral part of the planning procedure.
- **Contractor Acquisition Property.** Property procured or otherwise provided by a contractor for the performance of a contract provided in the terms of which title is vested in the government.
- **End Item.** A unit which is itself recognizable as a specific complete function.
- **Flow Time.** Relates to subsequent work to plant only. Represents the time between the date the component vendor re-

- ceives his contract and the time the component is completely fabricated and ready for shipment.
- **General Purpose Item.** An article adapted to more than one application.
- **Government Property.** All physical property owned by or loaned to the government, or acquired by the government as the result of a contract, except that property to which the government has acquired a lien or title solely as a result of partial, interim or progress payments.
- **Government Furnished Parts or Property (GFP).** Those items of equipment which, under the terms of an AMC contract, the AMC furnishes to the supplier or contractor for equipment maintenance, without charge, for incorporation into and items being manufactured for the USAF, under that contract.
- **Industrial Property.** Any customer acquired or government furnished property, including material, special tooling and industrial facilities employed in the performance of a contract or subcontract for supplies or services.
- **Lead Time.** In general, relates to second manufacturer's plant only. Represents the time between the receipt of the component at the supplier plant and the shipment date of the supplier (as represented as such) it is included. Also if the AMC planning is based on acceptance schedules. Therefore whenever lead time data is required in terms of ship completion it should be adjusted for the difference between ship completion and acceptance schedules. Lead time, however, is subject to many definitions. It may be used to mean the elapsed time from design completion to delivery of an end item. Lead time varies with the rate of production and during the definition procedure according to the following classification:
 - a. **Pre-Production Period.** Represents the time between the date of the receipt of the first direct material or component for production and the date of ship completion of the first article. (This period can relate to either component or service production). There is no time taken after the establishment and starting up of all available lines.
 - b. **Initial Production Period.** Represents the time between the ship completion of the first article and the attainment of the peak rate of production or "leveling off point" (assuming final production level).
 - c. **Peak Rate Production Period.** Represents that period from the time peak rate is reached until production is terminated or discontinued.
 - **Licensing.** An individual company, firm or corporation authorized by a licensee to use his proprietary design rights (patents being included) in patents in the manufacture of articles covered by said rights.
 - **Licensor.** An individual company, firm or corporation holding proprietary design rights, manufacturing methods or patents who enters into a written agreement, schedule these rights, methods or patents

- may be used by other individuals, companies, firms, corporations or the government.
- **Material.** Such property as may be an integral part of or attached to the end products to be delivered to the government in which may be consumed or expended in the performance of a contract. It includes, but is not limited to, raw and processed material, parts components, assemblies, expendable small tools, and consumable supplies.
- **Modification.** The physical alteration of a product or general purpose item, accomplished to permit a specific adaptation of the modified article.
- **Part.** An individual piece of an end item or assembly.
- **Partial Fulfillment Bond.** Bond securing the performance and fulfillment of obligations contained in a patent claim.
- **Payment Bond.** A bond entered in connection with a contract, securing payment of all persons supplying labor and material in the prosecution of the work provided for in the contract.
- **Performance Bond.** A bond entered in connection with a contract, securing the performance and fulfillment of all the obligations, covenants, terms, conditions and accessories contained in the contract.
- **Plant Equipment.** Personal property consisting of machinery, equipment, fixtures, vehicles, machine tools and other production equipment, used in capable of use in the manufacture of supplies or in the performance of service or for any intermediate or general plant purpose. The term does not include special tooling.
- **Prime Contractor.** A contractor who has entered into a written agreement with the government to perform work or furnish supplies.
- **Property Account.** The official records of government property furnished to a contractor by a government department.
- **Repeal.** Property in such condition that it has no reasonable prospect of being sold on any of its original contract.
- **Rebuild Time.** Represents the sum of the flow time, shop time, and lead time.
- **Special Purpose Item.** An article subjected by design or physical characteristics to an intended application.
- **Special Tooling.** Property of such type valued solely for its use, without substantial modification or alteration, is limited to the production of the particular article in performance of the particular service the which required or furnished. It includes, but is not limited to, gages, fixtures, jigs, patterns, special dies, special gauges and special test equipment.
- **Specification.** A description of the tools and measurements for a material, as data, or a series of instructions which the purchaser can determine whether or not the requirements have been met.
- **Stock Bond.** A perpetual running bond of record which does not attach to a deed and expanded and the balance on hand with respect to such stock of material and special tooling.
- **Subassembly.** A unit of an assembly composed of two or more parts fastened together.
- **Subcontractor.** A contractor who has entered into a written agreement with a prime contractor to perform work or furnish supplies.





In this new edition of "A Guide for Selling to the United States Air Force" our object once more is to bring up-to-date information on Air Force procurement for all manufacturers who may be able to contribute in greater or lesser degree to the current extension of United States air power.

Since the last issue of this booklet the tremendously accelerated Air Force buildup has profoundly affected both the size and scope of the Air Materiel Command buying job. Within the course of a comparatively few months after the outbreak of hostilities in Korea the volume of contractual instruments went up 66%, dollar value in procurement jumped 430%. In fiscal year 1952 the Air Materiel Command will buy about \$16 billion worth of modern air power to strengthen the nation's air defenses.

This increase is not merely a stepping up of bulk quantities and value of material being procured. It represents a phenomenal increase in the actual number of separate inventory items required. In 1941, at the beginning of World War II, separate items of Air Force supply numbered 90,000. By the beginning of the Korean action the number had risen to 487,000. It is now well over a million, an 1159% increase over the con-

tinuously sample days of 1941. The massive inventory includes everything from B-36s to socks. To procure it within the time schedule which the national safety demands we urgently need the production capacities, ingenuity, and full cooperation of every segment of American industry, large and small.

The astonishing size of our operation has become a major problem in itself. Overcrowding of AMC procurement headquarters in Dayton, Ohio, the growing bulk of necessary paperwork involved and transit time consumed in attempting to accomplish the whole job at one Headquarters convinced us that some decentralization would have to be effected for sound management.

We are presently carrying out a decentralization program in which the Headquarters will provide basic planning, management, control and surveillance of AMC worldwide activities, with numerous operating functions delegated to our various field locations scattered throughout the United States. In March of 1951 we replaced the seven existing procurement field offices with six air procurement district offices and a subsidiary network of regional offices, with considerable delegation of authority for contract administration, quality control and production guidance. Dubbing offices in these procurement districts can receive and make prompt payment on many types of invoices, saving the contractor time and the taxpayer dollar. We are also working to decentralize a larger volume of business to local purchase.

Other specialized Air Materiel Command functions have been, or will be moved to 15 different Air Materiel Depots throughout the United States.

It is our plan to place in these depots all of the functions, including, in many instances, procurement, associated with the commodities they store and distribute. The point of contact for some manufacturers will, therefore, shift from Wright-Patterson Headquarters AMC to the depots. Manufacturers will be notified before any such change is made.

We hope that those manufacturers doing business with the Air Force will find that the procedures set out in this booklet will be helpful to them in doing business with the Air Force. We believe that by following them the manufacturers will save themselves both time and effort. Any suggestions as to improving our procedures will be welcomed.

E. W. RAWLINGS
Lieutenant General, USAF
Commanding

I

How You Can Do Business With the Air Force

Thus is what the following pages will tell YOU—the small and big businessmen of this country.

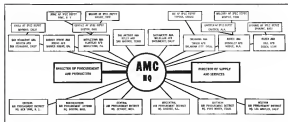
Perhaps you manufacture bolts, or maybe you can turn out complete aircraft, or perhaps you make mechanical toys. It doesn't really matter. The fact that you have a sound business, producing a dependable item, qualifies you to bid on Air Force contracts.

Approximately one million items are stocked by the Air Force. The vast majority of these products can be manufactured by firms not related to the aircraft industry but by companies which normally supply civilian needs.

Air Force buying or contracting is simple in principle although somewhat more complex in everyday practice. The Air Force either formally advertises each of its needs, calling for bids, and awards the contract to the lowest responsible bidder, or it negotiates contracts with qualified producers of the particular item needed.

Actually, FOUR principal procedures are used to purchase material for the entire worldwide Air Force, as well as for the Mutual Defense Assistance Program. These are: Central Procurement, accomplished by the Procurement Division at Headquarters, Air Materiel Command; Decentralized Procurement by Air Force Supply Depots; Local Purchase by a number of Air Force Bases and other installations throughout the country; and Research Buying by the Air Research and Development Command. A detailed explanation of these procedures will be given in succeeding pages.





II

The Organization With Which You Deal

The Air Materiel Command is charged with the responsibility for the Air Force's program of procurement, production, supply and maintenance. AMC has been designed along the lines of a large business, in contrast to the small concept of a formal military organization. The Command procures, distributes, maintains and repairs equipment and supplies for the entire Air Force.

Supervision over all AMC functions is exercised at AMC Headquarters, Wright-Patterson Air Force Base, Ohio. This includes the functions of programming and planning for the future. The actual day-to-day operations of the Command are closely interwoven with all actions of the Air Staff, particularly the Deputy Chief of Staff for Materiel, at Headquarters, USAF, and with all other major Air Force commands. This interrelationship provides the Air Force with a single integrated logistic system where effective business management and controls can be exercised.

The Directorate of Procurement and Production has the responsibility for selecting manufacturing sources, negotiating contracts with manufacturers, authorizing contract changes, and ensuring contractual surveillance over the procurement activities of AMC field organizations.

Three divisions carry out the activities of the Directorate of Procurement and Production: Procurement, Quality Control, and Production and Maintenance.

Procurement—The Procurement Division does the actual buying. It is you will find a number of subordinate organizations, each responsible for purchasing a certain group or groups of Air Force equipment. Purchasing responsibility is divided among three main Sub Divisions—Aircraft, Materiel and Mobilization, Research and Development.

The organizational chart shows the type of equipment purchased by each of the Branches and Sections within the Sub Divisions.

Production & Maintenance—The functions of the Production and Maintenance Division are closely allied to the procurement program. In January of 1951, this division replaced the former Industrial Planning Division, which had been responsible for the perfection of plans calculated to produce aircraft and supporting equipment during emergency periods. The

industrial planning function has been retained in the Production & Maintenance Division, but the division is now concerned primarily with assuring that the Air Force has construction with the necessary resources to produce equipment on schedule. It is also responsible for the determination of requirements for allocation of materials to Air Force commands, for the resolution of problems in manufacturing methods, and for the industrial phase expansion.

Quality Control—An important element of procurement and production is the quality control of end products. Responsibility for this function lies in the Quality Control Division. This division inspects and maintains a quality control policy to ensure that supplies accepted by the Air Force conform to the standards of quality prescribed by the Government. Actual inspection of end products is delegated to Commanders of Air Procurement Districts, who are responsible for assuring that all quality-control operations are performed in conformity with policies established by Headquarters, Air Materiel Command.

Field Organizations—It is clear that the Air Force may be physically close to the actual work being performed by industry, contract administration has been delegated to the Commanders of the six Air Procurement Districts, each of which is an organization within the Air Materiel Command, reporting directly to the Commanding General, AMC. These Procurement Districts, in turn, have jurisdiction over 25 regional offices located in industrial sections of the United States, and a number of Air Force Plant Representatives located at the larger airframe and other manufacturing plants. These Air Procurement Districts, in addition to being responsible for the administration of all contracts let by AMC, perform necessary investigations of probable contractor sources.

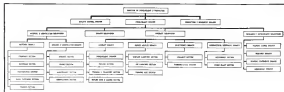
Another group of AMC field organizations, known as depots, has the prime function of storing and distributing materiel.

Theoretically, the United States is divided into two zones, with the Mississippi River the dividing line between east and west. The two-zone system provides that each zone stores and distributes the same items. In all there are sixteen

of these depots. There are eight Air Materiel Areas in the Continental United States, each with a Headquarters Depot, and eight Specialized Depots.

In addition to storing and distributing supplies, these

establishments now are responsible for establishing supply requirements and letting contracts in accordance with the decentralization program. The latter will be explained in detail under the heading of "Decentralized Procurement."



III

Central Procurement

Central Procurement involves the purchasing of aircraft and engines, propellers, spares and other Government Furnished Property, and items requiring extensive engineering. Contracts under this heading are negotiated and let by the Procurement Division, Directorate of Procurement and Production, Headquarters, Air Materiel Command.

Where You Start

"Let's go to Washington and see about an Air Force contract" has long been known much unnecessarily late and over expense. Washington is NOT the place to get an Air Force contract.

Actually, complete information on Air Force procurement activities is at your place of business at the nearest Air Procurement Regional Office.

Our country is divided into six Air Procurement Districts, each with a headquarters office and several regional offices. This "network" of field offices, under the direction of the Commanding General, AMC, administers Air Force contracts after they have been awarded. In addition regional offices are responsible for guiding you in letting yourself in a potential contract. In each of these offices throughout the country, Air Force representatives will furnish you with the necessary forms and information for making a proposal or submitting a bid; help you solve labor, material, and facility problems; furnish information on such matters as quality control, delivery, plant security, in fact, make available to you all the services connected with Air Force procurement, that of making the actual contract.

Each regional office has a bid board displaying copies of pending procurements, including formally advertised and those negotiated procurements considered suitable for award to small business concerns. Also posted are weekly Sourcebooks of Contract Awards which serve as a lead to first interested in subcontracting.

For addresses and maps of Regions and Districts, see Appendix.

How You Start

The Procurement Source List is the initial step in the letting of Air Force procurements. It serves a two-fold purpose—(1) it gets manufacturers and repair dealers an opportunity to list themselves as potential contractors, and

(2) it makes available to the Air Force a list of potential contractors desirous of supplying the needed items.

In the past few years, the Source List, as well as the number of items being procured, have increased to such an extent that a mechanical system of listing potential contractors had to be employed. Based on mechanical listing machines, the "mechanical bidding list" was established. This system lets for each item bought by the Air Force those manufacturers and dealers who have indicated that they can supply the item.

The Procurement Source System is based upon the use of the Air Force Commodity List (AFCL). This list, which combines in one volume some 30,000 commodity catalogs previously used, contains a general listing of the thousands of items which the Air Force normally procures. The Air Force Commodity List thus enables you to tell the Air Force which type of items you are able to produce or supply.

For placement in the Source System, either of the following actions must be taken:

By Letter

A. Write a letter to the Commanding Officer of the Air Procurement Regional Office containing information over the items in which your firm is located reporting that your company is established in the Procurement Source System. This letter should include information as to your present activity, number of employees, and products sold or manufactured.

B. Upon receipt of your letter, the Regional Office will send you a Bidder's Mailing List Application, an Air Force Commodity List, and complete instructions.

C. After you receive the Air Force Commodity List, examine it carefully and then circle the code number preceding the name of the items you can supply.

D. Fill out the Bidder's Mailing List Application, and return it with the completed Air Force Commodity List to the Air Procurement Regional Office.

E. Your firm will then be established in the Procurement Source System at Headquarters, Air Materiel Command, for

the items you have selected.

► By Personal Contact

- A. Visit the Regional Air Procurement Office in your area
- B. The same procedure as outlined above will be followed in listing your company as a potential source

A PERSONAL VISIT TO YOUR REGIONAL OFFICE MAY PROVE ADVANTAGEOUS, SINCE IT GIVES YOU THE OPPORTUNITY TO DISCUSS YOUR PROBLEMS AND ASK PERTINENT QUESTIONS. THE OVERALL WORKLOAD AT AMC HEADQUARTERS IS GREAT. YOU CAN AVOID DELAY AND SAVE UNNECESSARY CORRESPONDENCE BY LISTING YOURSELF THROUGH THE FACILITIES OF THE REGIONAL OFFICE.

The "Bid Sets"

► **IFB's & RFP's**—Invitations for Bid, used for formally selected procurements, are cautiously referred to as IFB's. Requests for Proposal, used for negotiated procurements, are referred to as RFP's. Keep these terms—IFB and RFP—in mind. If you will hear them often.

IFB's are issued to all manufacturers and regular dealers appearing on the Procurement Sources List for a particular item being procured by means of formal advertising. A limited action supply is maintained to meet requests from new sources not already established in the Procurement Sources List but who have learned of the proposed procurement through other means.

RFP's are mailed to firms already established within the Sources System who are capable of producing the item in question. This is known as negotiated procurement.

Naturally, procurements are advertised whenever and where ever possible. However, Public Law 415, 50th Congress, authorizes the negotiation of procurements during a national emergency such as now exists, or in other special cases.

Because of the emphasis on going small business a larger share of the defense production dollar the Air Force has "modified" its policy on negotiated procurement. Suitable RFP's and IFB's are now posted at Regional Offices instead

of following the submission of firms listed in the Sources System. Also, requests of these RFP's are published in suitable news media, and in the Department of Commerce in the same manner as IFB's. This gives potential suppliers an opportunity to let the Air Force know that they are interested in a particular negotiated procurement.

Occasionally Purchase Requests (Air Force authority to start procurement action) are submitted directly to the respective layer of the particular procurement. The layer that acts in the source system is called to determine which firms to contact. Under the modified procedure every effort is made to consider all available sources whenever an item comes up for procurement. In this manner firms which have never before bid an Air Force contract are often invited to submit a proposal.

The only way to reach you are instead of receiving IFB's or RFP's is simple too for submission of both is to make arrangements to be listed in the Sources System for all items in which you are interested and are capable of producing. All Request Air Procurement offices are fully equipped to supply all required information and advice via in connection with Air Force procurement. It should never be necessary for you to go to Wright-Patterson Air Force Base in Dayton to quickly as a prime contractor or to obtain information.

► **Adviser Notice-to-Procure** with certain procurements, an Adviser Notice is sent out to the firms established in the Procurement Sources System for the particular item to be procured. This notice is in the form of a circular letter with a return card and contains a description of the item, the quantity to be procured, and the delivery schedule. If you want to bid on the procurement, you should mark the return card accordingly. Space is also provided on the card to indicate that while you are not interested in the particular procurement, you do desire to remain in the system.

In other case, it is of extreme importance that you return this card, at failure to reply to an Adviser Notice or invitation to bid is interpreted to mean that you are no longer interested in maintaining in the system for the particular item being procured.



IV

Decentralized Procurement

Under the Air Materiel Command's decentralization program certain procurement activities will be transferred to field installations. Since decentralization will have an effect on the way you do business with the Air Force, an up-to-date explanation is in order even though the program is subject to change.

First, Air Materiel Command Headquarters and Air Force Specialized Depots have been affected in procurement projects for a portion of AMC's overall procurement responsibility. All depots now make purchases up to \$10,000 regardless of the type of item or material involved, within the limits of their capabilities. However, present decentralization plans call for the distribution of purchasing authority for procurements in excess of \$10,000 to only one of the Depots.

Amc's, engines, propellers, guns, spare parts and other Government Property, and items requiring extensive engineering will continue to be bought by the Procurement Division at Headquarters, Air Materiel Command.

It is estimated that the latter group represents the major portion of the Air Force dollar. The moving away of the procurement activities away from Headquarters, AMC is expected that a considerable amount of the paper work now "hanging up" the procurement picture at Headquarters can

be eliminated and procurement procedures speeded. ► **What's Involved?**—After the procurement responsibility for a certain commodity is transferred to one of the "field" installations, you will be required to submit your bids and proposals to the individual installation responsible. Each procurement office will establish its own bid list and provide facilities for potential contractors similar to those at Headquarters, AMC. For reference, each agency will have a Small Business Office and Contracting Relations Office for your convenience.

If you are now regarded as a potential source at Headquarters, AMC, you will be notified officially when and where to submit for those commodities which will be decentralized. Announcements will also be made through the press and other news media.

The following is a list of proposed locations of general procurement activities for the items now purchased by the Procurement Division at Headquarters, AMC. The approximate date these changes go into effect and the supply classes involved are included. These changes become effective about June 1, 1972. Again, it is cautioned that this schedule is subject to change. However, you will be kept informed about any future changes in Air Force procurement as they arise.

832nd AF Specialized Depot Topeka, Kans.

(Approx. date of change—1 Sept. 1972)

CLASS	NOMENCLATURE
47	Depos, Parts & Consumables
17	ITA & F
42	Specialized Tools
25A	Molds, Forms & Structures
25B	Composites Materials
26A & 27	Fasteners, Hous. Parts & Tubes (Commercial Hardware)
48	Chemicals
49	Flags, Bunting & Banners

Military AF Specialized Depot Memphis, Tenn.

(Approx. date of change—15 Sept. 1972)

CLASS	NOMENCLATURE
44D	Ammunition Groupings & Parts
47E & G	Stand Tools—Non-Formal
47D	Ammunition Tool Kits
47H	Maintenance Tools, Clothing's
25A	Office Equipment & Maintenance Parts

25B	Office Supplies
48	Instruments
49	Building Materials
49	Household & Building Equipment
49	Laundry & Dry Cleaning Equipment
73	Agricultural Equipment Implements & Parts

Wheeler Station Air Materiel Area Robins Air Force Base Waverly, Miss.

(Approx. date of change—15 Oct. 1972)

CLASS	NOMENCLATURE
47A & F	Shop Machinery, Equipment, Accessories & Parts
22	Landing Facilities
48	Stone Articles & Parts (including Class 50A)
49	Motor Vehicles & Parts (including Class 41A)
49	Motor Vehicles & Parts

Mohale Air Materiel Area Brookley Air Force Base Mishak, Ala.

(Approx. date of change—15 Sept. 1972)

CLASS	NOMENCLATURE
47D	Military Equipment & Parts

Middlebrook Air Materiel Area Okla. Air Force Base Middlebrook, Pa.

(Approx. date of change—1 Sept. 1972)

CLASS	NOMENCLATURE
30B	General Equipment & Purchases

Geoffrey AF Specialized Depot Duxton, Ohio

(Approx. date of change—1 Aug. 1972)

CLASS	NOMENCLATURE
48C	General Tools & Tooling
48C	Electrical Components & Parts
48C	Lamps & Tools
48C	Rails & Rail Mount. Parts
48C	Radio Cables
48C	Cables
48C	Cable & Transformers
48C	Resistors
48C	Switches, Circuit Breakers & Parts
48C	Vacuum Tubes & Parts
48C	Relays, Connectors, Solenoids & Parts
48C	Electrical Insulators, Kneels & Shells
48C	Lub. & Shop Tool Equipment

Wilkes AF Specialized Depot Shills, Ohio

(Approx. date of change—15 Oct. 1972)

CLASS	NOMENCLATURE
48C	Radio Materials
48C	Building Connectors, Ties & Tubes
48C	General Purpose Clothing
48C	Military Uniforms, "M"
48C	Personal Equipment
48C	Footwear, "M"
48C	Military Uniforms, "T"

Wright AF Specialized Depot Dayton, Ohio

31F	Personnel, "P"
31H	Inspection, Disposition & Repair
30A	Tactical Facilities & Control
31A	Terminals, Ladders, Ties & Cables
21B	Systems & Engines
30B	Jump, Air Force Publications
30B	Technical Orders & Other Technical Publications
30D	Control Technical Books, Periodicals & Catalogs
30E	Black Plans
10F	Formers, Charts & Maps, Publications
06E	Development

Rouse AF Specialized Depot Rome, N. Y.

(Approx. date of change—10 Sept. 1972)	
CLASS	NOISE/STRUCTURE
06A	Control, Blast Equipment & Parts
06B	Elect. Supplies
06D	Flying Field Night Lighting Equipment & Parts
10C	Elect. Wires & Cables
10C	Photographic Supplies
10D	Control Radar Equipment & Parts
10E	General Radar Equipment & Parts
10F	Metereological Equipment
10G	Supplies & Parts
10H	Location Plans for General Control & Blast Equipment

Telegraph, Teletype—Where & Facsimile Equipment & Parts
General Radio: Cables, Equipment
Telephone & Wood Audio Equipment & Parts

Chick AF Specialized Depot Maywood, Calif.

(Approx. date of change—1 Oct. 1972)	
CLASS	NOISE/STRUCTURE
7A	Naval Instruments, Accessories & Parts
20	Aircraft & Air Equipment & Parts
40A	Formers & Facsimile
40B	Formers
40C	Formers & Sigs

approach, evenly precludes selection for a particular project.
► **Developing knowledge** if available.
Your information will be used to determine which source will be asked to quote on individual specific projects. Therefore, it is essential that the information present conclusions as to specific fields of interest and ability.

The extent of development work makes it mandatory that all contractors be set on a negotiated basis. However, every effort will be made to consider you for procurement of a particular development item if you are qualified to perform this type of work.

In order to make certain that your company is listed with ARDC as a research and development source, you should, in addition to forwarding the above information to AMC, submit the same information to the proper ARDC procurement authorities.

If interested in ground electronics research and development, write to:

Commanding General
Rouse AF Development Center
Chick AF Base
Rome, N. Y.

If interested in basic research initiated at WADC, write to:

Commanding General
Wright Air Development Center
Wright-Patterson AF Base, Ohio
Attn: WCUC

If interested in research and development work at ARDC centers other than RADC and WADC, you should communicate with:

Commanding General
Air Research and Development Command
P. O. Box 1795
Baltimore, Md.
Attn: RDMPR

V

Research and Development Procurement

The Air Research and Development Command (ARDC), with Headquarters in Baltimore, Md., was established in 1953, thus separating the research and development function of the Air Force from its maintenance, supply and procurement functions. The new command is subdivided into eight Air Development Centers, each of which is concerned with a definite type of research activity.

Basic Research

The job of buying basic research, not involving "real items" has been delegated to ARDC by the Commanding General of AMC, who is the sole procurement authority for the Air Force. The Directorate of Procurement of the Air Research and Development Command is responsible for procurement of theoretical and experimental studies of basic sciences which form the groundwork upon which future advanced engineering will be built. The Command also encourages the presentation of new ideas in the field of basic research and will evaluate such ideas for future consideration.

Development

Development projects involve materials which are quite different from production projects. Existing approved items as definite Government drawings and specifications are usually not available. Frequently only a desired performance characteristic is described. Consequently, the procurement personnel affecting the buying of development contracts are somewhat different from regular procurement staffs as they are basic to the initiation of a production program. Accordingly, it is essential in the procurement of development work for full consideration to be given to productivity factors which will prove the way for a successful production program.

Development work involving "end items" is generally procured by the Air Materiel Command. The acquisition is ground electronics development which is under engineering at the Rouse Air Development Center, (RADC), Griffiss Air Force Base, Rome, New York, and such development projects as may be initiated at ARDC upon other than Wright Air Development Center, (WADC), Wright-Patterson Air Force Base, Ohio.

R&D Procurement

The Research and Development Sub-Committee, Directorate of Procurement and Production, AMC, is the buying agency

for development initiated by WADC. This subcommittee also oversees procurement of all research and development procurement activities for the Directorate of Procurement and Production.

In order to be considered for Air Force development contracts let by AMC, write a letter to:
Commanding General
Air Materiel Command
Wright-Patterson Air Force Base, Ohio
Attention: NCIPPR

containing the following information:

OCCUPATIONAL

- A. Type, i.e., occupation, partnership, proprietorship, etc. (profit or non-profit institution).
- B. Status in which incorporated, if incorporated.
- C. Patent acquisition, and/or subsidiary (if applicable).
- D. Total number of employees, including parent and subsidiary organizations, number of employees in your region and number of employees in the research and development activity of your organization.
- E. Name of person to contact in connection with this type of Government contract work.

PERSONNEL

Name and following biographical information on each of your leading design and development personnel:

- A. Educational background.
- B. Work history.
- C. Books or papers published.
- D. Patents taken out.
- E. Current field of endeavor.
- Descriptive of the main equipment or unusual laboratory and other facilities pertaining to development.
- Significant development projects your organization has accomplished for its own use or for any outside sponsor. Those projects most nearly involving critical or unique fields of interest should be emphasized. The "Jack of all Trades"

VI

Local Purchase

The term "Local Purchase" denotes the purchase of materials, supplies, and services by an Air Force installation for use and consumption by that installation or other installations assigned to it for use of materials and supplies.

These items are generally of a "housekeeping" nature, such as office supplies and so-called "off-the-shelf" items, and usually are bought in small quantities.

All local purchase functions involving appropriated funds are accomplished by Headquarters, Depot, or Base Purchasing and Contracting Offices. Being responsible for all purchase actions at their respective installations, they receive purchase requests from initiating activities and accomplish procurement action by formal advertising or negotiation, generally from firms in close geographical proximity.

The same laws and regulations which apply to central Air Force procurement also apply to local purchase.

Following is a list of Air Force installations at which local purchasing is done. Consideration should be directed to the attention of the Purchasing and Contracting Officer at each installation.

Birmingham Mun. Airport Birmingham, Ala.	Wright Air Procurement District 151 W. Washington Blvd. P. O. Box 3040 Trompsburg, Md.	Sacramento AMA McChesney AFB Sacramento, Calif.	Tuslobit AFB Falcon City, Fla.
Golden AF Specialized Depot Golden, Colo.	2000 W. Washington Blvd. Los Angeles, Calif.	San Bernardino AMA Norris AFB San Bernardino, Calif.	MacDill AFB Tampa, Fla.
Mobile AMA Brookley AFB Mobile, Ala.	Comp. Bldg. Meriden, Conn.	Fort AFB Colorado Springs, Colo.	Eglin AFB Valdosta, Fla.
Maxwell AFB Montgomery, Ala.	Chick AF Specialized Depot Maywood, Calif.	Lewis AFB Des Moines, Iowa	Maxwell AFB West Palm Beach, Fla.
Coast AFB Santa Ana, Calif.	Griffiss AFB Macedonia, Calif.	Washington National Airport Washington, D. C.	Mountain Home AFB Mountain, Idaho
Wurtsmith AFB Charlestown, Mass.	Edwards AFB Muroc, Calif.	Bolling AFB Washington, D. C.	Pease AFB Fennville, Fla.
Lake AFB Phoenix, Ariz.	Palmdale AFB Palmdale, Calif.	Andrews AFB Washington, D. C.	Townes AFB Albany, Ga.
Davidson AFB Tucson, Ariz.	George AFB Victorville, Calif.	Devos AFB Des Moines, Iowa	Lockport AFB Pittsfield, Mass.
Yarn Mfg. Plant Tucson, Ariz.	Long Beach Municipal Airport Long Beach, Calif.	New Castle County Airport Wilmington, Del.	Dulles AFB Herndon, Va.
Travis AFB Fairfield, Calif.	March AFB Revere, Calif.	Perich AFB Cocoa, Fla.	Hunter AFB Spartanburg, S.C.
Hawkins AFB Hamilton, Calif.	March AFB Sacramento, Calif.	Orlando AFB Orlando, Fla.	Moody AFB Valdosta, Ga.

IX Subcontracting

One of the most practical means of participating in the Air Force procurement program, especially for firms in the Small Business category, lies in the field of subcontracting.

As Manual Circulars in utilizing every means at its disposal to provide potential subcontractors with information on sources of prime contracts.

In this connection, it must be stressed that subcontractors deal only with prime contractors above the Air Force requires prime to subcontract in such is possible.

The following contract clauses have been approved and made mandatory for use in all cost-type and fixed-price supply and construction contracts in excess of \$5,000.

It is the policy of the Government as declared by Congress to keep about the greatest utilization of small business concerns which is consistent with efficient production.

"The contractor agrees to accomplish the maximum amount of subcontracting to small business concerns that the contractor finds to be consistent with the efficient performance of this contract."

In its constant effort to broaden the industrial base in the total procurement program, the Air Force in March, 1949 authorized the use of Brigades of Contract Awards, which are distributed to Air Procurement Regional and District offices, and to all Department of Commerce field offices. These agencies are used for referring potential subcontractors to holders of low-level prime contracts. The system includes the name and address of the prime, a thorough description of the work purchased, and the dollar value of the contract.

Other Government purchasing agencies compile similar information and forward it weekly to the U. S. Department of Commerce in Chicago. Reports from individual procuring agencies are considered under a "Consolidated Synopsis of U. S. Government Procurement Information."

This synopsis is distributed weekly without charge to Chambers of Commerce, Manufacturers Associations, State and Federal employment offices, and other useful groups throughout the nation. The agencies generally post these notices in public bulletin boards for reference by interested firms in their area. In some cases the notice appears in a newspaper and distributed to members of the organization.

Because the "Consolidated Synopsis" is compiled weekly the information is up-to-date. Firms which have made extensive use of this service have expanded operations in the new business gained through this medium.

If your firm is considered a small business and you are interested in working as a subcontractor, contact your Air Regional Small Business Specialist and ask to be placed on his list of potential subcontractors. He can then refer you to such prime contractors who may have subcontracting requirements for the particular products you are able to supply. He will be helpful in preparing a brochure for use by the Small Business Specialist.

► What You Can Do—In addition to taking advantage of the

small government-sponsored program for the assistance of small business in obtaining subcontracts under the defense mobilization program, there are many things the small business owner can do directly with the prime contractor to create opportunities for participating in defense production.

A mere declaration of willingness is not enough to obtain a subcontract. The prime contractor will have to make a careful investigation and appraisal of the subcontracting facilities available in a potential subcontractor before an analysis can be placed.

Before a potential subcontractor's facilities can be evaluated, the prime contractor will need to have complete data as to the capabilities of the subcontractor to perform various types of work. This data should be prepared as fully as possible and should cover the entire structure of the potential prime contractor's organization. Specifically, the prime manufacturer will need to know the following:

- Type of work the company is prepared or equipped to perform including reference to any previous experience in air craft work, such as World War II subcontracting, or any other experience with the Air Force, Army, or Navy.

- Plant size and location of the plant or plants, including amount of floor space for production, size of heat or other substructures strength of floor, dimensions of the ceiling, etc.

- Facilities—a complete list and description including machine, tool, model number and operation, of all the power and equipment and equipment available, including equipment on order with expected delivery dates, identified by factory number, and listing its use and condition. Types of generating, heating, plant, or cooling facilities. Facilities available for inspection should be listed, as should any facilities available for research.

- Personnel—total number of employees, including breakdown of production and other employees, personnel officials, percentage of skilled to unskilled workers, special skills, wage rates and labor resources.

- Financial—bank and credit references.
- Miscellaneous—facilities for plant security, transportation facilities—rail and highway network, and plant flight hangar, other facilities—technical background, complete available additional work, and of course, the names and addresses of both plant and office.

It is recommended that you make the initial contact with the prime contractor by letter, submitting this information. This will save valuable time for both the prime contractor and you and it is more likely to obtain a visit, rather than just a casual call at aircraft plants. It will frequently require several days for the various interested departments of the prime contractor's plant to survey your proposals and to determine whether or not your facilities can be integrated into the prime's current program.

One thing should be remembered: Prime contractors are not in eager to have qualified subcontractors as they are to subcontract.

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Production Pools

Production pools were in general rare during World War II, and are now authorized by the Defense Production Act of 1950, Section 705. As yet there can be no serious talk of it, however, it is likely that, as the defense effort accelerates, production pools will again become popular.

Regional Small Business Specialists may be questioned by groups concerning the requirements for the formation of the pool.

To obtain proper approval, the plan of operation of such a pool must be submitted to the Pooling Section, Procurement Assistance Division, Office of Small Business, National Production Authority, United States Department of Commerce. Since such pools may be within the jurisdiction of the antitrust laws or the regulations of the Federal Trade Commission, it must be shown that the proposed pool is in the public interest as a contributing factor to the National Defense, is that (1) Defense production will be accelerated by the pool's facilities, or (2) more effective distribution of the defense contracts among smaller business companies and spread of employment will be achieved; (3) defense production will be further decentralized. Other justification may be applicable to the particular situation.

Groups planning to form such pools should contact the nearest local office of the National Production Authority for detailed information.

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Types of Air Force Contracts

Contracts, which are the legal documents of the business world, are used by the Air Force as by any other large business. Each type of contract is tailored to suit the particular contract.

- Fixed Price—Price established per unit or job without any provision for adjustment. Used for formally advertised purchases, also for negotiated purchases where costs can be forecast with reasonable accuracy.

- Fixed Price With Incentive—Price established by negotiation is subject to adjustment by subsequent further negotiation. Used for negotiated purchase where factors such as uncertainty of cost, long lead time, insurance time, or other similar reasons prevent reasonably accurate forecast of cost.

- Cost Plus—(Including Cost-Plus-Fixed-Fee and Cost-Plus-Fee) These contracts are characterized by the absence of any "profit." The Government's understanding is to reimburse the contractor for his cost as determined in accordance with a designated standard, and in the case of a cost-plus-fixed-fee contract the contractor is paid a fee for performing the work.

- Time and Material Contracts—Provide for payment for materials at cost without profit, and for labor at specified hourly rates which rates include direct labor, overhead, and profit.

- Letter Contracts—Temporary contractual instruments, containing description of articles purchased but no prices nor delivery schedule. (These are also referred to as "order contracts" or "blanket orders" under NPA regulations). Issued when it is essential to give the contractor a leading commitment of order, in order to permit him to proceed without delay pending negotiations and

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X You Should Know About—

preparation of defective items and to incur costs up to a limit stated in the letter contract.

- Awards—A written acceptance of a contractor's offer, issued after receiving an acceptable detailed quotation, notifying the contractor of the acceptance of his quotation and thereby constituting an official contract. It is later superseded by a definitive document.

- Basic Agreements—An agreement between the contractor and the Government, setting forth general terms and clauses to be used in specific contracts. Usually a contractor's standard documents are set forth in addition to many alternate clauses that may be used, depending upon the particular procurement. It is used to incorporate the basic agreement and specific alternate clauses in contracts, thereby eliminating physical repetition of words in contract articles.

- Call Contracts—An agreement between the Government and a contractor wherein the contractor, for a specific period, agrees to furnish as "Call" at the Government's discretion, specified in the "Call" of these articles described and priced as stated in the contract.

- Open Contracts—An agreement between the Government and a contractor wherein the contractor, for a specific period, agrees to furnish as "Call" at the Government's discretion, specified in the "Call" of these articles described and priced as stated in the contract.

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Annual Performance Bond

The annual performance bond may be used to eliminate the necessity for filing a performance bond with each contract that requires one.

An annual performance bond is submitted to the Air Force for any part of a specific fiscal year (July 1 to June 30, inclusive) and covers all contracts which require performance bonds pertaining to the contractor listed in the conditions clause, up to and including the period when set forth in the annual performance bond. It may be written for any amount agreed to by the contractor and the users of services.

Payment Bond

The payment bond guarantees that the contractor will make payments in full to subcontractors, employees and pay for all supplies and equipment.

General bonds are not usually required in connection with contracts other than contracts covered through performance bonds are required. The requirements for payment bond will be set forth in the Invitation for Bid and contract. However, payment bond will be required in connection with any construction contract exceeding \$1,000 in amount. The penal sum of the bond will be set forth in the contract by the contracting office.

Advance Payment Bond

Advance payment bonds are seldom required due to the security provisions of an advance payment agreement. However, if the bond is required, it shall be covered by a corporate or individual surety or guaranty. The penal sum of the bond must equal the full amount of the advance payment it supports.

Patent Indemnification Bond

Patent indemnification bonds will be required only in connection with contracts which require provision for patent indemnity and then only if a performance bond has not been executed and the financial responsibility of the contractor is unknown or doubtful. Whenever such a bond is required, the penal sum thereof will be as an amount deemed adequate by the contracting office for the protection of the Government.

Miscellaneous Bonds

At the discretion of the contracting office other types of bonds may occasionally be required in connection with Air Force contracts. In such cases, the details of the bond are worked out with the contractor.

Facility Capability Report

In order to protect the interests of the Government, as well as the contractor, the Air Force has established a Facility Capability Report which is submitted by the buyer prior to the award of any procurement in excess of \$10,000.

This report is required from the appropriate Air Procurement District by the buyer after he has evaluated all bids or proposals from prospective sources. On the basis of the contract information submitted by the buyer, the district bases its report about the firm tentatively selected for award on the following:

- Are the firm's present facilities satisfactory to perform the contract being considered for award?
- Is the firm's financial stability sufficient to perform the contract being considered for award?
- Does the firm have the necessary production capabilities in consideration of present production load and past performance?
- Are the business ethics of the firm above reproach?
- What percent of subcontracting is contemplated?

The Facility Capability Report, among other pertinent

data, is used as a criteria in determining if the contract award will be made to the firm tentatively selected for award by the buyer.

Financial Aid

It is the policy of the Air Force to require contractors to be able to perform their contracts either with their own funds or with financial assistance from sources other than the government. Government assistance may, however, be granted in appropriate cases, preference is to method of assistance being:

- Partial Payments
- Guaranteed Loans
- Advance Payments

Partial Payments

Partial payments, also called progress payments, provide reimbursement of 75% of the contractor's costs in 90% of labor and materials as incurred before he is able to obtain adequate payment by delivering complete articles. When completed articles are delivered, due amounts previously paid as progress payments are recovered. Progress payments are authorized at the discretion of the buyers. To operate satisfactorily with progress payments, a contractor must have sufficient funds to meet his payroll as they fall due, since he cannot be reimbursed until after he has paid his laborers. The contractor must also have sufficient credit to be able to obtain shipment of purchased parts and materials, since he cannot seek reimbursement until he has received the delivery of these items. An example of a partial payment exceed 90% of the total contract price.

Guaranteed Loans

Guaranteed loans are bank loans, negotiated between the contractor and a bank of his own selection, repayment of which the government guarantees up to a stipulated percentage of the loan value. The guarantee is recorded by the Federal Reserve Bank, as fiscal agent of the Air Force, after certification as to the eligibility of the contractor by Headquarters AFMC and after investigation and approval by Headquarters USAF.

Advance Payments

Advance payments are monies made available to a contractor without his having first laid out his own funds or incurred liabilities in performance of the contract. Advance payment funds are initially deposited in a special account subject to reimbursement by the administering contracting office and the contractor from which they are transferred to the contractor's uncontracted account as the work advances. Adequate security is required to be furnished by the contractor. Payments falling due to the contractor for delivered items, or as reimbursements for cash received, are made into the special account, which then becomes a revolving fund subject to alternating withdrawals and replenishments. Advance payments may be authorized only by the Assistant Secretary of the Air Force under provisions of the Armed Services Procurement Act of 1947. Advance payments must be used for effort costs on a specific contract and may not be used for costs incurred on increasing facilities.

Specifications

Because specifications are continually being revised, the Air Force does not usually furnish them with procurement of the item is initiated. At that time copies of appropriate specifications are furnished with the Invitations for Bid and Requests for Proposals. Each Air Procurement Regional

office is furnished drawings and specifications at the time ITB's and RFP's are issued and maintains a file of individual specifications that can be requested upon request.

Reproduction and distribution of Air Force specifications are extremely expensive operations. Consequently, prompt consideration of requests for copies is given only when made in connection with a proposed bid. Because of the tremendous workload involved in present operations, requests for specifications for other than a proposed procurement must wait. However, they will be serviced. The Air Force asks that requests be kept to a minimum and then made only when absolutely necessary in the best interest of national defense.

If you require a particular Air Force specification, your request should include the specification number and title, and be directed to either the Commanding General, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio, Attn: WACDPC, or the Air Procurement Regional Office in your area. Requests for specifications of branches of the Armed Services other than the Air Force should be addressed to the specific Department concerned.

Gratuities

Air Force government activities are subject to the provisions of the various public laws and regulations which apply to the expenditure of public funds. Certain laws apply to those personnel charged with the responsibility of negotiating or administering Government contracts.

In the conduct of private business certain customs have become established. Persons considered ethical include gifts of personal or family use, special discounts, and other valuable favors. In the conduct of Government business these customs cannot be applied in order that applicable laws may not be violated. Not only the letter but also the spirit of the law must be observed.

It is our firm desire that all phases of Air Force procurement be accomplished in such a manner that no suspicion or criticism, however slight, can result. Personnel, both military and civilian, are cognizant of the stringent laws and regulations which govern their conduct as representatives of the Government and endeavor to comply therewith.

The cooperation of individual firms in carrying out these policies as set forth will be appreciated by all personnel of the Air Materiel Command.

Selling Agents

The "Contract Against Contingent Fee" clause which is included in all Air Force contracts is a warranty by the contractor that he has not employed or retained any person or selling agency "to induce or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commission or selling agencies main-

tained by the contractor for the purpose of securing business."

Although not considered illegal within the meaning of the clause referred to above, "contingent fee" are subject to scrutiny by Air Force procurement officials. It considered out of line with the value of the services rendered, they are subject to reprobation and disavowal from the point of view of the usual extent as other cost elements of a negotiation.

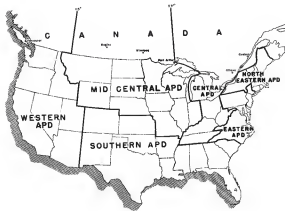
Frequently Used Abbreviations

The following is a list of abbreviations that you will, at one time or another, come in contact with. This list is by no means complete, but it does include the more frequently used terms in AFPP (Air Force Procurement Procedures).

- AF—Air Force
- AFB—Air Force Base
- AFV—Air Force Manual
- AFPP—Air Force Procurement Procedures
- AFPR—Air Force Plant Representatives
- ACD—Adjutant General Office
- AMA—Air Materiel Area
- AMC—Air Materiel Command
- AFD—Air Procurement District
- ARDC—Air Research & Development Command
- ARL—Air Regional Representative
- ASPR—Armed Services Procurement Regulation
- CFE—Contractor Furnished Equipment
- CG—Contracting General
- CO—Contracting Officer & Contracting Officer Representative
- CPFR—Cost Plus Fixed Fee
- DD—Department of Defense
- DN—District Name
- DO—Director Office Instruction
- FP—Fixed Price
- GFAP—Government Furnished Aircraft Equipment
- GPP—Government Furnished Property
- IG—Inspector General Office Instruction
- IG—Inspector General
- IFB—Invitation For Bid
- JAG—Judge Advocate General
- MDAP—Material Defense Assistance Program
- MR—Manufacturer Representative
- NPA—National Production Authority
- PIA—Price Information Officer
- PR—Purchase Request
- QC—Quality Control
- RFP—Request For Proposal
- SDPA—Small Defense Plant Administration
- TM—Technical Manual
- TO—Technical Order
- WADC—Wright Air Development Center
- WPAFB—Wright Patterson Air Force Base

Appendix

Geographical Boundaries of Air Procurement Districts



Northeastern Air Procurement District

- **NORTHEASTERN AIR PROCUREMENT DISTRICT** serves Maine, Vermont, Massachusetts, Rhode Island, New Hampshire, Connecticut (including Fairfield County) and New York State north and west of, but not including Orange, Ulster, Greene and Columbia Counties.
- **Address:** Commanding Officer, Northeastern Air Procurement District, 14 Court Square, Boston 8, Mass.
- **Telephone:** LAdams 1-7150
- **Commanding Officer:** Col. William P. Farnsworth

- **BOSTON AIR REGIONAL OFFICE** serves Maine, New Hampshire, Vermont, Massachusetts (including Air Force Plant Representatives at General Electric Co., Raytheon Works, W. Lenz), Rhode Island and Connecticut (including Fairfield County).

- **Address:** Air Regional Representative, Boston Air Regional Office, 10 West Street, Boston 11, Mass.
- **Telephone:** LAdams 3-5130
- **Air Regional Representative:** Lt. Col. Horace Cannon

- **ROCHESTER AIR REGIONAL OFFICE** serves New York State north and west of, but not including Ulster, Orange, Greene and Columbia Counties, and including the APPLs at GE-Schenectady and Syracuse, and Bell Aircraft Corp., Niagara Falls.

- **Address:** Air Regional Representative, Rochester Air Regional Office, 30 Stronach Place, Rochester 3, N. Y.
- **Telephone:** GRover 1015
- **Air Regional Representative:** Lt. Col. Richard F. Aron

Eastern Air Procurement District



► **EASTERN AIR PROCUREMENT DISTRICT** serves New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, District of Columbia, New York State north and east of, and including Oswego, Ulster, Greene, and Columbia Counties, and New York City and Long Island, and Fairfield County in Connecticut.

• **Address:** Commanding General, Eastern Air Procurement District, 655 Madison Avenue, New York 21, N. Y.

• **Telephone:** Teletype 5-9300

• **Commanding General:** Maj. Gen. Arthur Thomas

► **NEW YORK AIR REGIONAL OFFICE** serves Essex, Columbia, Dutchess, Greene, Kings, Nassau, New York, Orange, Putnam, Queens, Rockland, Sullivan, Ulster and Westchester Counties in New York State, and Fairfield County, Connecticut.

• **Address:** Air Regional Representative, New York Air Regional Office, 57 Canal Street, New York 4, N. Y.

• **Telephone:** Dign 4-9500

• **Air Regional Representative:** Col. Albert W. Jensen

► **NEWARK AIR REGIONAL OFFICE** serves Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union and Warren Counties in New Jersey, and Richmond County in New York.

• **Address:** Air Regional Representative, Newark Air Regional Office, 215 Market Street, Newark, N. J.

• **Telephone:** Mitchell 3-1454

• **Air Regional Representative:** Col. Richard D. White

► **PHILADELPHIA AIR REGIONAL OFFICE** serves Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Salem Counties in New Jersey, Delaware, Maryland, North Carolina, Pennsylvania, Virginia and District of Columbia.

• **Address:** Air Regional Representative, Philadelphia Air Regional Office, 1411 Walnut Street, Philadelphia 2, Pa.

• **Telephone:** LOU 7-3885

• **Air Regional Representative:** Col. Douglas L. Ransquist



Central Air Procurement District

► **CENTRAL AIR PROCUREMENT DISTRICT** serves Ohio, West Virginia, Kentucky, Tennessee, lower peninsula of Michigan and all of Canada.

• **Address:** Commanding Officer, Central Air Procurement District, W. Warren Avenue & Loaysa Boulevard, Detroit 32, Mich.

• **Telephone:** Telex 4-6000

• **Commanding Officer:** Col. Russell Keller

► **DETROIT AIR REGIONAL OFFICE** serves lower peninsula of Michigan.

• **Address:** Air Regional Representative, Detroit Air Regional Office, W. Warren Avenue & Loaysa Boulevard, Detroit 32, Mich.

• **Telephone:** Telex 4-6000

• **Air Regional Representative:** Lt. Col. George A. Miller

► **CLEVELAND AIR REGIONAL OFFICE** serves portion of Ohio south of Highway 30 and 30N, and other located on the highway.

• **Address:** Air Regional Representative, Cleveland Air Regional Office, 1279 West Third Street, Cleveland 15, Ohio

• **Telephone:** CH 3-7960

• **Air Regional Representative:** Lt. Col. John A. Hampton

► **DAYTON AIR REGIONAL OFFICE** serves West Virginia and southern part of Ohio including Hamilton County.

• **Address:** Air Regional Representative, Dayton Air Regional Office, Fourth Floor, U. S. Building, Fourth & Main Streets, Dayton 2, Ohio

• **Telephone:** HEN 3-0451

• **Air Regional Representative:** Lt. Col. Lawrence H. Frugh

► **CINCINNATI AIR REGIONAL OFFICE** serves Hamilton County, Ohio, Kentucky and Tennessee.

• **Address:** Air Regional Representative, Cincinnati Air Regional Office, Third Floor, Big Four Railroad Building, Cincinnati 2, Ohio

• **Telephone:** DOR 2-2280

• **Air Regional Representative:** Lt. Col. Morris J. Drubek

► **CANADIAN AIR REGIONAL OFFICE** serves all of Canada.

• **Address:** Air Regional Representative, Canadian Air Regional Office, 250 Temperley Building 4, Ottawa, Ontario, Canada

• **Telephone:** 2-5211

• **Air Regional Representative:** Maj. Wilton O. Henderson





Midcentral Air Procurement District

► **MIDCENTRAL AIR PROCUREMENT DISTRICT** serves Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Nebraska, Wyoming, upon portions of Michigan, and Waukegan County, Illinois.

► **Address:** Commanding Office, Midcentral Air Procurement District, 161 North Canal Street, Chicago 6, Ill.
 ► **Telephone:** State 3-2640
 ► **Commanding Office:** Lt. Col. Robert L. Fedorak

► **MINNEAPOLIS AIR REGIONAL OFFICE** serves Minnesota, North Dakota, South Dakota, Montana and the portion of Wisconsin west of the Mitchell-Wadena line.
 ► **Address:** Air Regional Representative, Minneapolis Air Regional Office, 975 Second Avenue, South, Minneapolis, Minn.
 ► **Telephone:** Atlantic 8-115
 ► **Air Regional Representative:** Lt. Col. James J. O'Donnell

► **CHICAGO AIR REGIONAL OFFICE** serves Iowa and Illinois above the northern boundaries of Adams, Brown, Cass, Douglas, Edgar, Mason, Muscatine, and Saginaw Counties.
 ► **Address:** Air Regional Representative, Chicago Air Regional Office, 161 North Canal Street, Chicago 6, Ill.
 ► **Telephone:** State 3-2640
 ► **Air Regional Representative:** Lt. Col. Edward E. Brink

► **ST. LOUIS AIR REGIONAL OFFICE** serves Missouri, Waukegan County, Kansas, Nebraska, Wyoming and the portion of Illinois below the northern boundary of Adams, Brown, Cass, Douglas, Edgar, Mason, Muscatine, and Saginaw Counties.

► **Address:** Air Regional Representative, St. Louis Air Regional Office, 1806 Concord Avenue, Clayton 3, Mo.
 ► **Telephone:** Parkway 15270
 ► **Air Regional Representative:** Lt. Col. Donald E. Sonck

► **MILWAUKEE AIR REGIONAL OFFICE** serves upon portions of Michigan and the portion of Wisconsin east of the Mitchell-Wadena line.
 ► **Address:** Air Regional Representative, Milwaukee Air Regional Office, 775 N. Franklin Avenue, Milwaukee, Wis.
 ► **Telephone:** Broadway 2-4091
 ► **Air Regional Representative:** Maj. Robert N. Smith

► **SOUTH BEND AIR REGIONAL OFFICE** serves the portion of Indiana north of the southern boundaries of Benton, White, Elkhart, Cass, Miami, Huntington, Wabash, and Jay Counties.
 ► **Address:** Air Regional Representative, South Bend Air Regional Office, 521 North Eagle Place, South Bend 16, Ind.
 ► **Telephone:** South Bend 3-2181
 ► **Air Regional Representative:** Lt. Col. Wilbur C. Chason

► **INDIANAPOLIS AIR REGIONAL OFFICE** serves the portion of Indiana south of the southern boundaries of Benton, White, Elkhart, Cass, Miami, Huntington, Wabash, and Jay Counties.
 ► **Address:** Air Regional Representative, Indianapolis Air Regional Office, Seventh Floor, Test Building, 14 Monument Circle, Indianapolis, Ind.
 ► **Telephone:** Market 1381
 ► **Air Regional Representative:** Lt. Col. James D. Firo

► **ATLANTA AIR REGIONAL OFFICE** serves Georgia, Mississippi, Alabama, South Carolina and Florida.
 ► **Address:** Air Regional Representative, Atlanta Air Regional Office, Belle Isle Building, 46 Houston Street, N. E., Atlanta, Ga.
 ► **Telephone:** Walnut 4121

► **WICHITA AIR REGIONAL OFFICE** serves Kansas (including Waukegan County), Oklahoma and Colorado.
 ► **Address:** Air Regional Representative, Wichita Air Regional Office, P. O. Box 1941, Wichita 1, Kan.
 ► **Telephone:** 4-4165
 ► **Air Regional Representative:** Lt. Col. Carlos C. Pratt

► **DALLAS AIR REGIONAL OFFICE** serves Texas, Louisiana, New Mexico and Arkansas.
 ► **Address:** Air Regional Representative, Dallas Air Regional Office, 1407 Ross Avenue, Dallas, Texas.
 ► **Telephone:** Riverside 6951
 ► **Air Regional Representative:** Lt. Col. John H. DeLoe

► **MEMPHIS AIR REGIONAL OFFICE** serves Tennessee, Mississippi, Alabama, Georgia, and Florida.
 ► **Address:** Air Regional Representative, Memphis Air Regional Office, 1407 Ross Avenue, Memphis, Tenn.
 ► **Telephone:** 2-4165
 ► **Air Regional Representative:** Lt. Col. Carlos C. Pratt



Southern Air Procurement District

► **SOUTHERN AIR PROCUREMENT DISTRICT** serves South Carolina, Georgia, Florida, Alabama, Louisiana, Mississippi, Arkansas, Oklahoma, Texas, Colorado, New Mexico, Kansas (including Waukegan County).

► **Address:** Commanding Office, Southern Air Procurement District, 1309 Windway Place, P. O. Box 9835 Fort Worth 7, Texas.
 ► **Telephone:** Summit 6181
 ► **Commanding Office:** Col. Wilbur C. Chason

► **ATLANTA AIR REGIONAL OFFICE** serves Georgia, Mississippi, Alabama, South Carolina and Florida.
 ► **Address:** Air Regional Representative, Atlanta Air Regional Office, Belle Isle Building, 46 Houston Street, N. E., Atlanta, Ga.
 ► **Telephone:** Walnut 4121

► **WICHITA AIR REGIONAL OFFICE** serves Kansas (including Waukegan County), Oklahoma and Colorado.
 ► **Address:** Air Regional Representative, Wichita Air Regional Office, P. O. Box 1941, Wichita 1, Kan.
 ► **Telephone:** 4-4165
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 ► **Telephone:** Riverside 6951
 ► **Air Regional Representative:** Lt. Col. John H. DeLoe

► **MEMPHIS AIR REGIONAL OFFICE** serves Tennessee, Mississippi, Alabama, Georgia, and Florida.
 ► **Address:** Air Regional Representative, Memphis Air Regional Office, 1407 Ross Avenue, Memphis, Tenn.
 ► **Telephone:** 2-4165
 ► **Air Regional Representative:** Lt. Col. Carlos C. Pratt

Western Air Procurement District

• **WESTERN AIR PROCUREMENT DISTRICT** covers Idaho, Utah, Arizona, Washington, Oregon, Nevada and California

• **Address:** Commanding General, Western Air Procurement District, 151 West Washington Boulevard, P. O. Box 1049, Terminal Annex, Los Angeles 34, Calif.

• **Telephone:** Prospect 4711

• **Commanding General:** Maj. Gen. William M. Morgan

• **SEATTLE AIR REGIONAL OFFICE** serves Washington, Oregon and Idaho

• **Address:** Air Regional Representative, Seattle Air Regional Office, c/o Boeing Airplane Co., Seattle 14, Wash.

• **Telephone:** MEldale 1937

• **Air Regional Representative:** Col. Waymond A. Davis

• **SAN FRANCISCO-OAKLAND AIR REGIONAL OFFICE** serves Utah, and California and Nevada north of the northern boundary of the Glendale Region

• **Address:** Air Regional Representative, San Francisco-Oakland Air Regional Office, Fifth Floor, Jorgensen Center Building, 3515 Clay Street, Oakland 12, Calif.

• **Telephone:** TEam 34530

• **Air Regional Representative:** Maj. Bert R. Eckstein

• **GLENDALE AIR REGIONAL OFFICE** serves Los Angeles County north of northern boundary of Los Angeles Region, Ventura, San Luis Obispo, Santa Barbara, Kern, San Bernardino and Riverside Counties, California, and Clark County, Nevada

• **Address:** Air Regional Representative, Glendale Air Regional Office, 1411 Avenue Drive, Glendale, California

• **Telephone:** CITrus 4-5175

• **Air Regional Representative:** Col. Daniel A. Cooper

• **LOS ANGELES AIR REGIONAL OFFICE** serves Orange County and the portion of Los Angeles County south of a line drawn from the Pacific Coast north on Topanga Canyon Road, east on Mulholland Drive and Burbank Boulevard, east and south to the Los Angeles River, east on Main Street and U.S. Highway 60, and southeast on Orange Grove Avenue (Formosa) to the Los Angeles-San Bernardino County line

• **Address:** Air Regional Representative, Los Angeles Air Regional Office, P. O. Box 2042, Terminal Annex, Los Angeles 34, Calif.

• **Telephone:** Prospect 4711

• **Air Regional Representative:** Col. Edmund P. Gatten

• **SAN DIEGO AIR REGIONAL OFFICE** serves Imperial and San Diego Counties, California

• **Address:** Air Regional Representative, San Diego Air Regional Office, 5165 Pacific Highway, P. O. Box 7910, San Diego 17, Calif.

• **Telephone:** WIndward 6811

• **Air Regional Representative:** Lt. Col. Stephen P. Dillon

• **TUCSON AIR REGIONAL OFFICE** serves Arizona

• **Address:** Air Regional Representative, Tucson Air Regional Office, c/o Grand Central Aircraft Co., Merrill Airport, Tucson, Ariz.

• **Telephone:** TUcson 51791 or 18611

• **Air Regional Representative:** Lt. Col. James L. Pattle



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3 CFM
3000 PSI

4 CFM
3000 PSI

0.4 CFM
1200 PSI

1950

1952

1942

50

5 CFM
7 PSI

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MYCALEX 410

MYCALEX 410 IS APPROVED FULLY AS GRADE L-4 UNDER NATIONAL MILITARY ESTABLISHMENT SPECIFICATION JAN-10 "INSULATING MATERIALS, CERAMIC, RADIO, CLASS L" CAN BE INJECTION MOLDED, WITH OR WITHOUT METAL INSERTS TO EXTREMELY CLOSE TOLERANCES

CHARACTERISTICS

Power Factor, 1 megacycle.....0.0015
Dielectric Constant, 1 megacycle.....5.2
Loss factor, 1 megacycle.....0.014
Dielectric Strength, volts/mil.....600
Volume Resistivity, ohm-cm. 1×10^{14}
Arc Resistance, seconds.....750
Impact Strength, ft.-lb.3.2
H-B, 1/16 in. of notch.....230
Max. Safe Operating Temp., °F.....440
Water Absorption, %, in 24 hours.....nil
Coefficient of Linear Expansion, °C..... 11×10^{-4}
Tensile Strength, psi.....4000
Compressive Strength, psi.....25000

MYCALEX 410X

MYCALEX 410X CAN BE INJECTION MOLDED WITH OR WITHOUT METAL INSERTS TO EXTREMELY CLOSE TOLERANCES

CHARACTERISTICS

Power Factor, 1 megacycle.....0.012
Dielectric Constant, 1 megacycle.....6.9
Loss factor, 1 megacycle.....0.263
Dielectric Strength, volts/mil.....600
Volume Resistivity, ohm-cm. 1×10^{14}
Arc Resistance, seconds.....250
Impact Strength, ft.-lb.3.6
H-B, 1/16 in. of notch.....0.6
Max. Safe Operating Temp., °F.....440
Water Absorption, %, in 24 hours.....nil
Coefficient of Linear Expansion, °C..... 12×10^{-4}
Tensile Strength, psi.....4000
Compressive Strength, psi.....20000

—a superior inorganic glass-bonded mica insulation featuring—

- LOW LOSS — HIGH EFFICIENCY
- PERMANENT DIMENSIONAL STABILITY
- HIGH DIELECTRIC STABILITY
- WITHSTANDS HIGH TEMPERATURE
- IMPERVIOUS TO OIL OR WATER
- IMMUNE TO HUMIDITY
- FREEDOM FROM CARBONIZATION
- EXCELLENT MECHANICAL CHARACTERISTICS



AVAILABLE IN SHEETS, ROOS, AND FABRICATED TO SPECIAL SHAPES

MYCALEX

LOW-LOSS MINIATURE, SUB-MINIATURE, AND UHF TUNER

TUBE SOCKETS

These sockets do not use active tube sockets phono-type yet electrical characteristics are for superior dimensional accuracy and uniformity are guaranteed

PRODUCED IN TWO GRADES

MYCALEX 410 is approved fully as Grade L-4 under N.M.E.S. JAN-10 "Insulating Materials Ceramic, Radio, Class L" MYCALEX 410X is lower in cost but its insulating properties greatly exceed those of present superior phenolics Both types available in 3" and 5" single miniature, sub-miniature and 12000. All are imported molded to high precision

—economical, widely applicable machines and molds to close tolerances

MYCALEX is a highly developed glass-bonded mica insulation backed by over a quarter-century of continued research and successful performance. In its present high state of development, MYCALEX contains every important characteristic demanded of a modern, permanent, efficient electrical insulating material. MYCALEX is supplied in sheets or rods, can be significant, as composition molded to close tolerances, is readily machinable, and can be fabricated in practically any size or shape. Dielectric losses are very low from 60 cycles to 100 kilohertz per second, its resistance, volume resistivity and other electrical characteristics meet the most rigorous requirements. Physical properties are equally advantageous.



CAN BE TAPPED, DRILLED, THREADED GROUND, OR MOLDED WITH INSERTS

MYCALEX

GENERAL CATALOG and ENGINEERS' HANDBOOK

Available on request, these data sheets cover 11 different grades of MYCALEX and include information on mechanical and UHF properties in all types of dimensions—regular models for top or bottom mounting, snap sockets, ground lug models and JAN types. MYCALEX tube sockets offer outstanding advantages over practically every other type, yet are priced competitively with the cheapest sockets available anywhere. Get the facts today!

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MYCALEX 400 IS APPROVED FULLY AS GRADE L-4 UNDER NATIONAL MILITARY ESTABLISHMENT SPECIFICATION JAN-10 "INSULATING MATERIALS, CERAMIC, RADIO, CLASS L"

CHARACTERISTICS

Power Factor, 1 megacycle.....0.0018
Dielectric Constant, 1 megacycle.....5.2
Loss factor, 1 megacycle.....0.013
Dielectric Strength, volts/mil.....600
Volume Resistivity, ohm-cm. 1×10^{14}
Arc Resistance, seconds.....750
Impact Strength, ft.-lb.3.2
H-B, 1/16 in. of notch.....230
Max. Safe Operating Temp., °F.....440
Water Absorption, %, in 24 hours.....nil
Coefficient of Linear Expansion, °C..... 10×10^{-4}
Tensile Strength, psi.....4000
Compressive Strength, psi.....31000

MYCALEX K-10

CHARACTERISTICS

Dielectric Constant, 1 megacycle.....10.4
Loss factor, 1 megacycle.....310
Loss factor, 1 megacycle.....0.024
Volume Resistivity, ohm-cm. 1×10^{14}
Dielectric Strength, volts/mil.....270
Impact Strength, ft.-lb.3.6
H-B, 1/16 in. of notch.....270
Max. Safe Operating Temp., °F.....400

MYCALEX K-10 IS APPROVED FULLY AS GRADE L-4 UNDER NATIONAL MILITARY ESTABLISHMENT SPECIFICATION JAN-10 "INSULATING MATERIALS, CERAMIC, RADIO, CLASS L" MYCALEX K-10X is lower in cost but its insulating properties greatly exceed those of present superior phenolics Both types available in 3" and 5" single miniature, sub-miniature and 12000. All are imported molded to high precision



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HOW AMC WORKS



LT GEN. F. W. RAWLINGS, Commanding General,

exercises command over the Air Materiel Command, and is charged with executing all lawful orders and directions of superior authority transmitted to him. He is responsible for the formulation and establishment of policies and plans to accomplish the Air Materiel Command mission and for their execution.



MAJ. GEN. W. H. TUNNER, Deputy Commander,

acts as the officer through whom the Commanding General exercises command over the Air Materiel Command. He performs the duties of the commanding officer in the latter's absence.



MAJ. GEN. G. W. BRUNDE, Assistant Deputy Commander,

is assistant to both the Commanding General and the Deputy Commander. Extends supervision over administration, organization and procedures within headquarters, Air Materiel Command and resolves problems relating to administration and operation of headquarters components or field activities.



COL. L. J. ANDERSON,

Executive, transmits the decisions of the Commanding General to appropriate staff officers, ensures that the orders are promptly and thoroughly executed, exercises general supervision over the administrative management, commands, finances, legislative matters and logistical matters within headquarters, AMC keeps CG informed on AMC matters.



MAJ. GEN. C. S. IRVINE,

Deputy Commander for Production, coordinates and supervises all phases of production at their affect headquarters AMC components, other armed services, other governmental agencies and industry, issues orders to AMC direction on matters affecting production and makes recommendations in the name of the Commanding General to activities outside of AMC.



BRIG. GEN. W. T. HEFFLEY,

Assistant for Materiel Program Coordination, advises the Commanding General on matters pertaining to and monitors the accomplishment of the command plans, programs, and materiel requirements cooperations. He maintains cognizance of the status of the accomplishment of the Air Materiel Command mission in its various phases.

The AMC Mission: Support for USAF

To most of industry, the Air Materiel Command is a peacetime purchasing agency run somewhat along business lines. To the United States Air Force, AMC is considerably more than that. And purchasing is only one of its functions.

Air Force regulations say there are the mission of the Air Materiel Command:

"To provide adequate and efficient system of procurement, production, maintenance, and supply for the United States Air Force.

"To provide general over-all logistical support for all activities and agencies of the United States Air Force.

"To train, sponsor and staff for the accomplishment of specified logistical functions in various areas and theaters."

In performance of that mission, AMC gets into many things other than plain purchasing. Its job goes very deep, in the setting up of production lines to furnish items to be purchased; the job continues long after purchasing, in moving that the items reach the Air Force consumer in time and in proper condition. In between the two extremes of production methods and packaging and shipment are a host of detail jobs.

On this and the preceding page are shown the top officers, and their functions, who organize and direct what is its essential is a logistics operation.

► **One of Several**—The key to understanding how AMC works is the realization that it is one of several commands in the Air Force. It is not independent, it does not exist to serve its own ends alone. The commanding general of AMC is responsible directly to the chief of the Air Staff. Nevertheless, he has to coordinate closely with other staff posts, such as the Deputy Chief of Air Staff for Materiel.

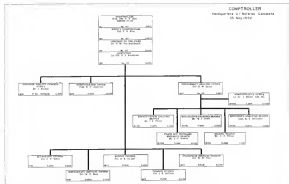
And AMC, in one sense, is the servant of combat commands such as the Strategic Air Force and Tactical Air Force. It exists to serve them, among others. The effective basis of its operations, to a large extent, can be measured by how ready SAC and TAC are to do their jobs.

But within its own realm, the logistic services of the Air Force, the Air Materiel Command has complete jurisdiction. It picks its own type of organization to do the job at the best way. As it presently stands, AMC is organized into five Divisions and several major staff offices.

- Directorate of Personnel and Training
- Directorate of Command Support
- Directorate of Supply and Services
- Directorate of Maintenance Engineering
- Directorate of Procurement and Production
- Comptroller's Office
- Inspector General's Office
- Judge Advocate General's Office

While the business staff has most of its dealing with the Directorate of Procurement and Production, the organization of logistic lines which is being carried on in the Directorate of Supply and Maintenance Engineering. As one index of how that change is being pushed, the former Directorate of Supply, Services and Maintenance Engineering recently had to be split into the two present organizations.

AMC organization must of necessity be as fluid as its job. Other changes are being contemplated. The overall chart of the command shown on page 51 gives some idea of the enormous scope of the present operation. The charts and reports on the following pages present the major efforts of the command.



Management Control Starts at the Top

- AMC's Comptroller Office is concerned with more than how the Air Force is spending its money.
- Its big job is studying better business methods; and it is sparking changes both in and out of AMC.

In the brand-new headquarters building of the Air Service Comptroller on Patterson Field every bulletin board, even desk top, carried the slogan: "Keep Things Flying."

Nine years ago in the critical days of World War II, that motto succinctly defined the vital logistical job of the comptroller.

At that dark time nobody would have stepped a rolling pin on this indispensable service. If anyone would have agreed that a dead taxpayer—whether in his redoubt lights or in his bombed-out home—couldn't bet about the dollar cost of national defense.

Nobody could argue over the fact that the Army Air Corps appropriation had rocketed to more than 100 times its amount five years before: up to a whopping \$17 billion. And that would look like more than \$10 billion in the Air Force's market area nowadays.

• A New Sign—Today those's number sign of the times on the bulletin boards

of the Air Material Command headquarters in the new nine-story-old building, it reads "More Air Force For Dollars."

The new slogan reflects the keen need to cut expenditures of an air force now. It's a public attitude so deep seated that even after two years of the glowing Korean war, Air Force officials still feel obliged to tink more of budgets than headlines.

Sixty days ago, Lt. Gen. E. W. Rusk, commanding general of the Air Material Command, told West Point graduates:

"A great many of the proposals made to me believe that what is known as the 'bulletin board' is capable of our concerns. We are going to have to prove that they are mistaken."

Comptroller's Office-In General Rusk's explanation, that proof is offered in the name of Brig. Gen. D. H. Baker, AMC Comptroller.

Congress has appropriated about \$30

billion for the Air Force for fiscal 1953. Of that sum, AMC will receive between \$15 billion and \$16 billion. So it will spend approximately \$1 out of every \$5 appropriated for the Air Force.

General Baker's job is to supply the "controls," the facts, methods and studies AMC top management needs to put that fabulous sum to work in businesslike ways.

AMC's money is apportioned in the budget division of his office. The sum he gets is apportioned there against uncommitted needs. In his office and divisions, methods are devised and submitted to management to get work properly and legally done, and with a saving of time, money and manpower. Facts are compiled. Systems are designed and studied. Money is paid out to Air Force suppliers and to AMC's military and civilian personnel.

To top this, the comptroller prepares a graphic presentation of all these items, yet interlocking functions, so that General Rusk and AMC top management can see at a glance the status of air power activity at any given time.

• World's Largest—To do all these things General Baker has to have the largest comptroller (room often called



The Aircraft: Lockheed F-94

The Engine: Pratt & Whitney Aircraft J-48 Jet
Fuel Metering: Holley Turbine Control

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Carries a fourteen-ton payload

2530 miles nonstop

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— the Douglas Liftmaster



Now in greater production for the military and the airlines, the Douglas DC-3 Liftmaster delivers efficient volume in military cargo and mail.

The Liftmaster is used by the Navy as HC-4, and by the Air Force as C-119A, has three key features: cargo compart-

ments, loading in 30 seconds, and more doors. Loading the back hatch, main cabin door, or side door is quick and easy. With its main cabin door open as its passenger compartment, the DC-3 Liftmaster provides the best used in the

air, making a superior 5000 cubic foot space in 30 seconds and more doors.

Performance of the Liftmaster is an order of magnitude greater than other cargo planes that can be mass-produced in the factory and faster than its biggest competitor, the Lockheed C-119.



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First in Aviation

member an industry organization in the world. It is largest both in staff and scope.

The work of the comptroller is performed by three top-level offices and two divisions at the headquarters of AMEC, and by counterparts at each AMEC field installation. Worldwide staff is some 7,500 officers, aides and assistants.

In the upper echelons are the offices of Administration, Management Analysis and Purchase Request Control. On the division level are Accounting, Budget, Finance, Management Services and Statistical Services divisions.

These organizations work with AMEC's five major departments of Procurement and Production, Supply and Services, Maintenance, Engineering, Command Support, and Personnel and Training. They cover every level from auditor to general. Sometimes it is hard for the observer to tell where the comptroller's functions end and management takes over.

► **Fields and Figures.** The magnitude of the task can be sampled from some AMEC facts and figures.

AMEC now has a world-wide military and civilian strength totaling about 200,000.

Supply divisions run a mammoth "asset value base" which tracks more than a million items. That's five times as many as in Sears, Roebuck's stock.

In the 12 months ending Nov. 30, 1971, Supply processed nearly 75 million items. These totaled 3,397,662 tons.

In 1971 Maintenance overhauled 1,949 complete aircraft, 27,919 aircraft engines, 217,431 accessories.

Checking such big operations as these is only a part of the comptroller's field of work. In these and in other Air Force activities he looks for what he calls "problem areas." Basically, a "problem area" is a situation in which reports show there is a need for improvement.

► **Three Fields.** General Baker sees the comptroller's division divided into three main fields.

"There's first our relations with our customers," he says. "These are the other major commands of the Air Force to which we give support in the form of goods and services."

"Next is our relation with industry. We're concerned with what industry is doing to reduce costs, and how we can assist them in meeting their objectives."

"Then there's our internal unit operations within the framework of the AMEC," he adds.

"We're developing a program which will enable us to control and manage our resources more effectively."

The most noticeable result of his efforts is the increasing use of industrial

planting, the building of what might be called industrial structures within the AMEC—operations which are organized to obtain as private industry would build them. The main difference is that they're not run for profit gain. Rather, they result in dollar savings.

Just dollar saving is not the only purpose which prompts these AMEC activities. Another goal is to work simply in the expectation of doing a better job.

These industrial structures were designed to get efficiency. They were devised to give better service to AMEC's Air Force "customers" and to work smoothly in the areas of war.

It would take some analyzing these days to dig up one of those now-famous "Keep 'Em Flying" posters that the community's aim to furnish with, dependable logistical support to a fighting Air Force always in agreement. It has to be that way. And that aim is a continuous thread running through the varied activities of the comptroller's office.

Accounting

In the Accounting Division there's a good view of AMEC's evolution from traditional military logistical procedures toward modern business methods.

A little more than a year ago accounting was practically a second-ranking function. Tim was handled in AMEC's old Budget and Fiscal office and other members of the command staff. Now the work of the division, a year old Aug. 1, clearly parallels the accounting function in industry.

The division's most significant work is being done in its Working Capital subdivision. This activity is charged with the account's supervision of all "working capital activities." These are two types: "stock funds" and "inventory funds."

Some of this is transaction; these are businesses set up within the Air Force to deal with AMEC's customers as private industry would deal with them.

One of these businesses, the Clothing Stock Fund, has turned the old-time quartermaster system of issuing uniforms out the window.

► **A Big Clothing Store.** Under the fund the Air Force has established a world-wide clothing store chain within its own framework. There are some 200 stores for uniforms. Their inventory comes to hundreds of millions of dollars. Current sales are measured in billions.

And gone is the old QM argument who showed night shifts across the counter. In the clothing store where Air Force clothing is displayed—not stacked, please—a trained salesman gives the woman the Brooks Brothers treatment.



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Use of molded plywood in the manufacture of such items as cylinders, tanks, housing doors, etc., is your answer to the most difficult of construction jobs can be achieved with this process. It is light and strong, lightweight, water-proof and unexcelled.



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- 5-inch scope gives high visibility
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- Full shielding by enclosure tube shield and end cover
- Dual screen: Demount knob, filter, and controls
- Hi-voltage power supply handles all 300 v. reticulation load conditions



SPECIFICATIONS

Overall Bandwidth—30 cycles
Bandwidth—adjustable selection for 1 pass, pulse width
IF Bandwidth—50 Hz standard (10 to 4 in increments)
 43 Hz bandwith recommended for CW and pulse widths 0.3 to 2 pass; 20 Hz bandwith recommended for pulse widths up to 8 pass
Sweep Frequency—10-30 cps—easily changed for special-purpose measurements
Power Requirements—115 volts, 40 cps
Frequency Spread—from 20 MHz to 5 GHz, 2 MHz, at 5 dBm
Model SAGE-1—frequency range, with 5-band head — 300 to 3000 mc
Model SAGE-2—frequency range, with 5-band head — 3000 to 10,000 mc



The VECTRON spectrum analyzer is a double superheterodyne receiver with a five-inch cathode-ray oscilloscope output indicator. The local oscillator is frequency modulated by the same waveform voltage source that produces linear basis and sweep on the cathode-ray tube. The components of an input signal are shown as vertical pips on the scope screen, the frequency and power of a component are indicated by the position and amplitude of its pip.

The analyzer can be furnished with either an 5-band or an X-band head. Heads for other frequencies are available on special order. The heads are interchangeable, allowing one basic unit to be used with all heads.

To assure trouble-free service, the instrument uses a shielded IF amplifier, oil-filled capacitors, and power-tube tubes. Removable case panels give quick access to the chassis if adjustment is ever necessary.

VECTRON ALSO OFFERS engineering and manufacturing service in the design and production of electro-mechanical apparatus. Your needs in development of instrumentation, gyro-mechanisms, communication networks, filters, servomechanisms, and electronic systems can be met by our plant, equipment, personnel, and experience.

Electro-Mechanical Equipment
VECTRON, inc.
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The auction pays for his purchases out of his clothing allowance.

Carl C. P. Tilton, chief of American (left).

"We have used millions of dollars through this stock fund. Those savings represent the difference in the case an inmate takes of clothing he buys and clothing he's given."

The term "stock fund" is applied only to those businesses which have been developed out of a supply base.

Colonel Tilton believes that a good many of AMC's 155 supply operations might be converted into a government-run business base.

At present his staff is planning ways to handle petroleum and lumber "sales" to AMC customers through the device of Industrial Products Division Glass Fabrics from a stock fund which "sells" goods, an "industrial fund" is a device for running an industry.

Could a maintenance depot be operated this way? With an established price list for overhauls and repair jobs? Facing its own labor and material costs and overhead, just like private industry?

When Robert Air Force base in Georgia may be the proving ground to test this concept. Anticipating that a ranking studies of the engine overhaul setup there to check possibilities.

If the Warner Robins overhaul is industrialized, the Air Materiel Area then would bill its customers (there would be the Air Force commands which send their planes there to be serviced) and the customers would pay out of their own budgets.

This means like taking money out of one Air Force pocket and putting it in another.

However, the real advantage of the system lies in the fact that the production of the shop will have to handle its business as he would in private industry. He will have to work and plan efficiently if his capital structure is not to be impaired.

Feeling Free?—An example of a going industrialized concern within the Air Force is the parking plant at Kelly Air Force Base in Texas which does parking work for government agencies in the Department of Defense, bidding for jobs at prices comparable with those of private industry.

Management Analysis

AMC is beginning to ramble private industry in other valuable ways. Through its Management Analysis Office and Management Services Division, the Comptroller is studying the management procedures of private industry and working out their application across the entire command.

Management Analysis does create

Any day of the week... any work of the year, you'll find one or more of the finest plastics engineers has stopped by for a "look-see" and a chat with the specialists at the Industrial Products Division of Hess, Goldsmith.

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Hufford Stretch-Wrap Forming Machines offer a new technique for forming metal to exact contour for stretching and are increasingly replacing the manual method around a hand pressman. Both extrusions and sheets are fabricated, frequently in the same machine. In addition, structural frame elements of various designs are easily formed then surface finished, painted, primed, and ready to use.

Because of these many advantages, Hufford Stretch-Wrap Forming Machines are now used by FPGT major aircraft manufacturers.

If you want to know more about HUFFORD STRETCH-WRAP FORMING, write to HUFFORD, 10000 W. 10th Avenue, Denver, Colorado 80202. We will send you a complete literature kit and answer all your questions.

Advances in the United States and by 50% of all aircraft manufacturers in the free world. It's a fact that is not only true but is becoming more so as the industry grows. The construction is completely simple and relatively low in cost. Stretch-Wrap Forming is one of the many HUFFORD innovations which are spreading world-wide as the output of world-class industrial equipment. Another example of HUFFORD engineering which is developing advanced equipment for the world's largest industrial organizations.



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Hufford Machine Works, Inc.
ALBANY, CALIFORNIA

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METAL FORMING MACHINES
METAL STRAIGHTENING MACHINES
METAL BULDOZING MACHINES
METAL CUTTING MACHINES

HUFFORD PRECISION HYDRAULIC PRESS

removes the risk of "over-servicing" on difficult straightening jobs. Equipped with the Automatic Stroke Limiter, the man is under positive control at all times, automatically comes to a halt at any pre-established setting. Can't cut what's been struck is turned by means of a graduated handwheel on the face of the press and will repeat with working accuracy. Applied force is indicated on a dial gauge and new work is tried on a counter to 300° from any starting position.



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with special features insuring

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The pressing can is equipped with the Automatic Stroke Limiter described above which gives man control precision. In addition, two overhead cylinders provide 15 tons of clamping force with, thereby ensuring precision of the pressure plates at all during metal forming operations. When cylinders release, work is quickly supported from rest without the usual unloading and re-bolting delays. Complete overhead track and clamping assembly is quickly removable for constant and applications. Both the Hufford Straightening Press and the Bulldozer were specially designed to successfully link problems common to aircraft production.



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GEN. BAKER. Facing a state of mind

analytical work. Its branches study and measure the effectiveness and efficiency of command operations. In other words, they find out how much was done, in a given job against what should have been done, and how well.

► **Electronic Museum.** No common product is put to these things by Management Analysis. Its measuring device is electronic. Facts about men and methods are sifted out of thick decks of punch cards spun through electronic business machines. On these machines, collected facts are sifted, sorted and analyzed.

The quality and level of thinking behind this work may be gauged by one of its members gleaned from the office. On 15 civilian analysts, seven have their master's degree in business administration. The remaining 11 have bachelor's degrees with additional graduate work. The educational background of officers is comparable.

The task of refueling the complex mass of information collected by the computer's activities to a least common denominator—the standardized charts which post management as the progress of each phase of AMC activity—also falls to Management Analysis.

Management Services

Management Services Division operates the computer's equipment, or personnel and procedural controls.

It does the manpower job. Col. W. R. Smith, division chief, says, "We are always dealing in change, and the Management Services' function has become even more important as these days of AMC decentralization on a limited budget."

MEETING MILITARY SPECS IS AN OLD STORY FOR T-W USERS

Specifications for aircraft and missiles are met by Taylor-Winfield's resistance welders. They have been producing resistance welds for more than 20 years. You can have the same quality and quantity of resistance welds from Taylor-Winfield as you can from any other resistance welder. You can have the same quality and quantity of resistance welds from Taylor-Winfield as you can from any other resistance welder. You can have the same quality and quantity of resistance welds from Taylor-Winfield as you can from any other resistance welder.

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The growing trend toward industrial methods shows increasingly here. The division is the backbone for the Management Improvement Cost Reduction program. Now special stainless steel, the program apparently was every tool-
supplies known to industry to fit the quality of management.

► **Problem Areas—Management Activities** over the company to point up "problem areas." Management Services goes to work, on them as the same way industrial management would handle them.

Working closely with private industry, Management Services finds ideas through such organizations as the Aircraft Industries Assn. Member of this group inherit reports to AMC on their methods of saving administration and manufacturing costs. To date 35 such reports have been turned in. In fact, AMC reports its strong assistance to the association. Through the division, the company also works with outside management consultant services.

► **Not Just Talking—These** contacts with industry are not merely a matter of talking things over. Colored Smith says AMC has initiated action on each applicable recommendation made—while industry inevitably has made some helpful constructive recommendations.

The Management Improvement and incentive programs have produced tangible results on which the division keeps tabs. Sometimes the actual dollar saving can be computed.

In one instance the setting up of a new procedure brought an increase in the compressor's own official hourly output. The saving of the purchasing department was a high ranking laborer at AMC headquarters. It took five trips across the 11-square-mile air base and a full extension search to process the paper. It also took 50 employees.

Management Analysis pointed the "problem area." Management Services followed by establishing a new procedure. Now only one trip across the base is necessary, and the new system is measured by 14 people. Forty-two employees could be directed to other work.

Thus came the question, when to put the new organization? AMC management decided to judge it with the compressor. It's called the Purchase Request Control office.

Finance

A few AMC people have been unhappy with decentralization. But get Col. J. H. McCown, chief of the Finance Division.

Finance's own decentralization has brought the Air Force both savings and growth. As Col. McCown puts it, Finance's program is disbursing sup-

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The increase in discount savings, amounting to some \$2,750,000 over the period, is more than the cost of the decumulation program.

During the 11 months, AMC Finance officers have disbursed some \$7 billion. Of that 86%, or over \$6 billion was paid out to Air Force suppliers (The remaining 14% was interest).

Budget Division's operations make it clear that the ANIC Comptroller ship is the real manager of the Air Force dollar.

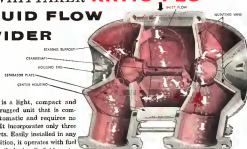
From a cost standpoint alone, one adds that AMC is responsible for efficient management of 82% of all Air Force funds. During Fiscal Year 1953, the amount involved will approximate \$30 billion.

• Early Estimates—The budget task of the Air Force in obtaining funds from Congress is complicated by the necessity of preparing estimates several months in advance. The forecasts must clearly show why a given number of dollars will be required for each of many thousands of items. Dollars for new items adapted as a result of unforeseen needs must be accurately determined. When the actual changes in aircraft designs are recognized, the tremendous problem of modifying dollars requires to generate a large Air Force is quickly met.

Problem: To maintain equal oil flow rates into the parallel oil columns of a piston engine system, regardless of varying pressure drops.



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gress." In other words, the best estimates of engines to be produced, aircraft to be serviced, etc., must be "grounded."

As operations progress, analyses of the financial picture are performed to find out where the AMC stands financially. In addition, future dollar positions must be projected.

These are examples of the many calculations involved in the budget job which strongly emphasizes "maximum *Air Force per dollar*."

Statistical Services

For a further measure of the growing importance of the AMC camp-tendency, take a look at an aircraft organization which needs some supplies.

It's a high priority order. The requisition goes into a business machine in punch card form, and is flashed to a U.S. overseas shipping point, punched back into a card, it goes to a Zurich supply depot. The order is made up and shipped. All this is done within 45 hours.

From there on, AMC controls let the company know what ship or plane is carrying the goods. If the ship is sunk or the plane downed, a duplicate shipment will be begun within 24 hours. An inventory report of the whole transaction is furnished by electrical transmission to overseas command.

The same business machines give each decentralized supply installation a world wide stock balance and consumption report.

The *Air Force* says it pioneered in electronic logistical computations. The first installation Log stock records at the Fairfield Air Depot in 1942.

► *Nose Center-Today*, a huge room on the AMC headquarters building houses hundreds of business machines which form a nerve center for almost every phase of the command's world wide activities.

Fed on raw statistics, they produce the factual computations on which the commander can base his studies for improvement programs.

Now performing functions far beyond their original property according job, they also peg the average cost of an engine overhaul, specifying the level of manpower and material costs.

As the commander's function has grown, the uses of the machines have multiplied.

Col. W. W. Vail, Chief of Statistical Services, reports that AMC is spending \$5 million a year on the leases of business machines throughout the command. That does not include overseas operations.

The machine's indispensable service probably has helped to effect savings



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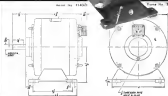
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may have more than their weight cost. Through "Stat," the controller lowers the losses of every engine, every airplane, by itself. And, incidentally, the compilation of these records gives the Air Force a complete history of every airplane it ever purchased.

Like "Stat," many of the computer's activities for automating the creation of his own office. The concept of industrial computerization is quite new to the Air Force. Relatively new, too, even in private industry.

The man who had most to do, it's believed, with the establishment of the Air Force computerization is Lt. Gen. E. W. Renshaw, former Air Force controller and now Commanding General of AMC.

In November, 1946, he was assigned the task of developing the Air Force computerization concept. Authorized in 1947—The computerization was authorized in 1947 under Public Law 216 which since has been the controller's bible. The AMC computerization was created in October that year. However some computer functions had been assigned to T-5 Plans in 1945.

Reporting on the Air Force computerization last year, Gen. Renshaw outlined the functions of the office and forecast its activities this way:

"In practice as in peacetime, the primary mission of the Controller will continue to be making advisory service in the management of personnel and resources.

"In peacetime, when funds are the limiting factor, this is accomplished by traveling personnel, material and other resources into the field.

"In wartime it is accomplished by using the resources themselves. Therefore we will bring about only a change of emphasis within the functions of the computer.

"Overall it is anticipated that the computerization (computerization) will become more consistent with the concepts of the Air Force. Intensity, the reporting, planning and management analysis functions will increase most, since these functions will bear the impact of increased reporting and servicing requirements. Moreover we may expect continued increase in the field of operations and inventory control reporting."

The forecast applies in every particular to the AMC computerization, which since has assumed an even greater importance in the eyes of the entire Air Force.

For, in commanding general of the Air National Command, Gen. Renshaw recently is expected to have an extraordinary appreciation and understanding of the vital functions of the AMC computerization.

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Lockheed provides for rapid expansion to meet air transport emergencies as well as a foundation for peace time production. While its recent rapid growth has been due mainly to the demands of increased aircraft production, Lockheed will remain to spearhead the progress of aviation and to bolster national security.

Features of the new plant are a new parts production building and a new engineering and administration

building, both recently completed, and a new Components Development Center now under construction. One large building, previously used for assembly of production engines, is now devoted by development work to bridge the difficult gap between experiment and production. Two huge new test cells, with a common control room, have been built especially large to accommodate engines of extremely high thrust ratings.

During the fastest ten years in history, jet engines designed and developed by General Electric have powered more planes, set more records, and flown more hours than all other U.S. jets combined. Now, with this experience, a team of skilled workers and the new facilities available at Lockheed, General Electric works for the future.

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Flexibility Is Key to AMC Maintenance

- It starts at Maintenance Engineering Directorate.
- And fans out through the country's major depots.

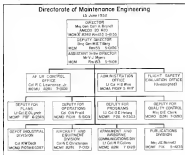
The Directorate of Maintenance Engineering is the central Air Force agency in the field of maintenance. It is responsible to furnish technical assistance, publications and data to ensure that Air Force equipment is maintained at maximum effectiveness in support of worldwide operations of the Air Force. This includes staff responsibility for maintenance, overhaul, repair of aircraft, manufacture of parts for emergency needs, modification and modernization programs, both within the Air Force establishment and by contractors. Maintenance standards, instructions and procedures that apply to all Air Force agencies are established by this Directorate.

The eight major Air Materiel Areas (AMAs) in depots which are strategically located throughout the continental United States give AMC flexibility in furnishing agent types of modifications and repairs, reconditioning of aircraft components and also in carrying on maintenance and modification programs. By retaining such equipment to a serviceable status through reconditioning processes, these AMAs save the Government millions of dollars annually, as well as conserving strategic materials necessary in the maintenance of new stock.

Responsibility for use of guidance of the Directorate's activities rests with the Directorate of Maintenance Engineering. To support the Directorate in accomplishing the overall maintenance mission, various depots and divisions comprising the Directorate are charged with performing specific functions.

► **Administration**—The Chief of Administration oversees staff surveillance over all administrative functions performed by the major components of the Directorate. This office also performs administrative duties for the office of the Director of Maintenance Engineering. These functions involve managing all staffed positions, preparing technical instructions and publications, evaluating final year trend hard requirements, disseminating stress for public information, monitoring the security program, accounting and distributing correspondence, and ensuring that all administrative programs are properly coordinated.

► **Plans**—The Deputy for Plans is responsible for maintenance and long range plans and requirements relating



to the accomplishment of future Air Force maintenance operations. Staff studies are prepared to review the adequacy of facilities for supporting present operations, as well as special staff studies, reports, and estimates relating to various problems such as affecting the maintenance and long-range plans of the Directorate. He handles the spending request for modification, modernization, depot contract maintenance, and technical consultant services. Personnel budget estimates for both depot and contract maintenance, as well as the construction of maintenance facilities at AMC installations, are developed and reauthorized.

► **Operations**—The Deputy for Operations is the control coordinator for the Directorate. He is supposed to develop procedures and prescribe policies for maintenance operations, as well as develop the organizational structure and make recommendations for the distribution of functional responsibilities. He analyzes the management of Directorate operations and monitors the preparation of publications showing the status of Air Force maintenance engineering programs, including and maintenance of Air Force equipment. Distribution of equipment within the Directorate is determined by the Deputy for Operations.

► **Programs**—The Deputy for Programs is in charge of all Directorate programs involving aircraft, missiles, and related equipment, including special weapons and ground equipment. The term

"special weapons" includes atomic weapons and equipment, biological and chemical warfare materials and equipment. He provides Directorate representation on all service, missile, and equipment coordinating groups and attends meetings and engineering inspections.

All concerned in special projects, major and minor modifications to aircraft, missiles, and equipment operated by the Air Force are coordinated and records are maintained showing their progress and current status. He acts for the Directorate in supervising, directing, and controlling functions of the various divisions as they relate to developing and carrying out the maintenance support of special weapons, and supervises wide maintenance support of the USAF in the field of special weapons.

► **Quality Control**—The Deputy for Quality Control establishes quality control standards for maintenance engineering and maintains surveillance over those developed by the AMAs. Technical consultation services are made available on standards and techniques relating to maintenance engineering quality control. Statistical quality control techniques and methods are researched, developed, and implemented for Air Force wide use in overhaul and maintenance operations.

► **Trouble Spot**—An important organization in the Directorate of Maintenance Engineering is the AF AFUS Control Office. The satisfactory report (RIR)

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is the medium for reporting failures, malfunctioning of any item of Air Force equipment, or military, technological design, defects resulting from faulty material, workmanship, or inspection, as well as unsatisfactory maintenance or supply losses, methods, or systems.

Since the inception of the UR system in July, 1951, the UR has rapidly grown in importance.

Because of the complexity of modern-day aircraft, and their related equipment, and the available resources in the case of the Air Force, it became impossible to attempt to handle within one organization the problem of solving all the aches and pains. It therefore became necessary to decentralize to the various Air Material Areas and bases on each of the processing and dissemination of data as possible, confining control of the various status at headquarters.

Each AMA and base organization now includes a UR control office where UR cases processed. In determining the facts for UR's, the AMIC and AMA organizations send themselves of the technical services of the Air Research and Development Command and through the Air Procurement Districts, of the various manufacturers responsible for the equipment which is the subject of the UR.

The Directorate's UR control office issues copies of all UR's, together with pertinent correspondence, which are numbered, coded, and processed to an AMIC personnel file. This serves as a statistical and historical record from which developments of trends in equipment failures can be detected. With this vertical line of control over the system, they are able to utilize the knowledge, know-how and facilities of the AMA's and manufacturers to provide more expeditious answers and solutions to reported deficiencies.

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Riding Herd on the AMC Depots

Depot Industrial Division also watches over AMAs to get the most out of maintenance facilities.

The Depot Industrial Division exercises constant-level control over the AMC depot-level maintenance program. Basically, the management function performed by this division consists of two principal responsibilities. The one is the development or revision of policies and equipment at AMAs or depots of Air Materiel Command to meet the rapidly expanding requirements brought about by the increase in Air Force strength. The other deals with the attainment of maximum production by maintenance facilities at activities of Air Materiel Command.

The first of the division's principal responsibilities is met by studying production methods and techniques, plant layout and facilities, building design and alterations in order to improve operations. Industrial engineering consultant services are provided for all AMC as well as USAF maintenance activities. Depot maintenance work specification programs are developed. Authority to acquire and keep up tool and equipment for depot maintenance activities is vested in this portion of the organization, as well as approval of depot maintenance plant and production facilities. Work specifications are prepared as guides in acquiring suitable equipment or modifying equipment to a new configuration.

The division's other principal responsibility is met by developing forecasts and establishing and monitoring depot work programs. Requirements are established and action initiated for maintenance contract services. As a result of studies required for work programs and production schedules, USAF maintenance and specialized support programs are monitored. Assigned research and development projects are considered as well as Air Force programs that are AMC or depot maintenance facilities.

Management jobs.—The division's job can be summed up. The Depot Industrial Division initiates Air Force depot maintenance support in phase with maintenance requirements by exercising command-level management of depot maintenance workloads, including civil workloads, within the Air Materiel Command and furnishing assistance to all USAF maintenance activities in the implementation of operational procedures and manuals.

The end result produced at the Air Materiel Area level is continuous building of new maintenance facilities together with improvement and expansion

of existing facilities to meet the requirements of a growing Air Force, and to ensure success of the Air Force industrial overhaul mission and the depot maintenance support mission.

In addition to the usual staff offices for handling the annual plans, operations, and administrative functions, the division is organized to support its two principal objectives by the following branches:

For Efficiency

The Production Engineering Branch of the Depot Industrial Division was set up to improve efficiency through constant development and improvement of production engineering methods and procedures. The scope of its mission is to provide direct monitoring and control of assigned functions as applied to guidance of AMC depots within the continental United States and to provide technical assistance or studies to other major commands and overseas activities.

The basic objective of the four sections comprising the branch is to secure the best utilization of AMC maintenance resources with great economy. To achieve this goal, each of the following specific functions is discharged by a different section:

General section.—Programs are planned and controlled through monitoring the two main maintenance specialization programs. The complexity and quantity of modern aircraft led to the development of what is known as the two-piece system of maintenance support. The United States is divided into Eastern zone and a Western zone, thereby providing two separate depot maintenance support areas. Under this plan one depot in each zone set up to take maintenance responsibility to all Air Force activities within its usual bound area, covering certain specified items.

Industrial engineering and management consultation services are provided for AMC and USAF maintenance activities by continuous review of depot production methods and techniques, plant layout and facilities and building design. This function requires presence of staff surveillance over industrial engineering groups established at each AMC Headquarters and requires regular liaison with command agencies to insure maximum application of improved industrial techniques. Standardized methods and procedures are developed and improved and their effectiveness monitored.

Changes are recommended in tool and equipment designs to provide for increased efficiency.

Depot tooling and facility programs are developed by developing alternatives for tools and tool equipment by the use of the initiative to determine if they are to be approved, and new or modified depot maintenance plants and production facilities are conceived for approval. Control of tools and tool equipment is maintained by constant review of requirements established for maintenance support of new aircraft engines and other Air Force operating equipment. Monitoring of requirements for tool facilities is accomplished by continuous review of workload programming data, prepared plans for new facilities, and plans for facility modifications.

Work specifications are prepared for modifying and upgrading Air Force equipment. These specifications or work guides are utilized by Air Force depots and commercial activities in acquiring and equipment to attainable conditions or in modifying existing equipment to conform with a new configuration.

For Monitoring

In line with the established policy which provides for providing modern industry to improve effectiveness of operations through development of existing engineering methods and procedures, the Production Control Branch has been established within the Depot Industrial Division. Its primary operational objective is to obtain the maximum possible production through full utilization of AMC maintenance resources.

The scope of the Production Control Branch job is to provide direct monitoring and control of assigned functions within the continental United States and to provide maintenance assistance to other major commands and overseas activities. Various efforts are set up to discharge specific functions of the branch office.

The Workload Coordination Office.—This office keeps in touch with depot and civil agencies and exercises overall surveillance of the depot workload program. It also keeps track of maintenance and production reports, recommending necessary changes to meet production requirements. Overall procedures and priority of workload assignments are determined in mutual agreement to insure that a check on relative program importance.

Aircraft Section.—Here is centered control over all maintenance programs including construction programs, to include aircraft projects in construction, modification, modification, modification, or

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again. All receipt papers and work directives or contracts involving depot level maintenance are initiated in this section and then are monitored and controlled.

Responsibility for scheduling, prioritizing and controlling for the Maintenance Engineering Directorate the aircraft storage program and the review and determination of disposition to be made of damaged aircraft units in this section.

► **Powerplant Section**—This section controls over powerplant depot maintenance programs and scheduled production schedules, including scheduled maintenance, to insure timely accomplishment of sufficient engine overhaul to meet supply requirements for serviceable engines.

This section initiates and controls all depot engine schedules and work programs, and is responsible for review and follow-up of engine work programs to insure adequate production and timely schedule changes.

► **Electronics and Avionics Section**—This is established, based on program work data and supply requirements, the depot schedule and modification programs for AF electronics and avionics equipment, and work schedules are checked, including contractual work programs, to insure adequate production of serviceable items. Depot work programs involving special weapons are controlled in this section.

► **Accessories and Associated Equipment Section**—The work programs involving accessories and miscellaneous equipment is controlled in this section. Depot schedules and programs, including contractual overhaul programs, are established and controlled. This section is responsible for timely accomplishment of scheduled work programs for equipment under its control.

Govt. Property Must Be Marked

All government property furnished to a contractor, with a few exceptions, must be marked and identified immediately on receipt. This includes government-owned special tooling.

Exceptions to the marking rule are granted when the contractor, his employees or other contracting agencies own or other materials of the same type at the same location, when adequate physical control is maintained by the contractor over tool crib issue, etc., issued for use by individuals in performance of the contract; when property is of the bulk type, or is otherwise unsuitable for marking, where property is commingled with the contractor's property, or cases where that is permitted.

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FOR
VIBRATION CONTROL**

New Armament:

As a result of the rapid increase in speed of aircraft and the improvement of engine defense systems, development of the armament program has been considerably accelerated to maintain the necessary effectiveness of combat aircraft.

Recent and judiciously timed developments made necessary the adoption of electronic control for computing systems, bomb sights, fire control systems, and launching systems, so that aircraft will be able to attain the desired combat efficiency during operations at high altitudes and high speeds.

Electronic computing systems appear to be the only solution known to date for the problem of coordination between armament control and radar systems.

In view of the importance and importance of these systems, it was decided that functions relating to these highly specialized classes of equipment be consolidated into one organization and completely separated from functions involving regular aircraft and engine equipment and accessories. As a result, a new activity was set up in the Materiel Engineering Directorate with the title of Armament and Airborne Communications Division.

For better results—in addition to the advantage of having responsibility for maintenance of armament and fire control systems, equipment consolidated in one organization, it was believed that such an organization would be more capable of supporting the anticipated expansion of Air Force programs.

For efficiency of maintenance and available funds would be reduced, as well as manual improvement of logistic support. Furthermore, discussion and action within the Air Materiel Group would be expedited, necessary coordination would be reduced, and budgetary aspects would be simplified.

In doing its job, the Armament and Airborne Communications Division exercises technical supervision over maintenance and utilization of USAF armament and airborne communications equipment, including the determination of requirements for complete and coordinated support organizations. It establishes the specification of work to be performed and delegates organizational responsibilities for the successful performance of the assigned mission.

Weapons Maintenance Planning support and accuracy technical direction are provided, and results of investigations are submitted. Technical assistance in the field of electronics is furnished all USAF maintenance activities. In collaboration with the AF special weapons program and the Air Force Research Commission, the division main-

A division set up to work on avionics and fire control

ten the Air Force maintenance of special weapons.

In addition to the usual complement of officers for administrative, plans, and operations purposes, the division includes a Bombing and Fire Control Branch, Weapons Branch, Guided Missiles Branch, Radio and Radar Branch, and Identification and Support Equipment Branch. These are all operating branches of the division and, according to the specific equipment peculiar to each branch, they are charged with formulating maintenance policies to insure reliable operation through continuous and adequate maintenance. Acceptance inspections are conducted on new equipment.

Key Branches—Each branch is responsible, not only for analysis, review, and revision of technical orders, handbooks, parts catalogs, and other technical publications affecting operation, maintenance, and repair of assigned equipment but also the technical provision of specifications governing preparation of such publications. Standards for quality and quantity of maintenance work are established. Unreliability reports and accident reports are investigated.

These branches also determine maintenance control standards, base of base and replacement factors, and the loads and amounts of training required for maintenance personnel.

In addition, the branches initiate programs for modernization of equipment, make technical studies in USAF field units and maintenance activities, and evaluate results of policies in effect. An example of this type of assistance was the recent visit to Korea of a group of USAF officers who examined the installation of new equipment which was developed in a replacement for most delicate electronic computers that could not withstand the shock of landings on the rough runways common there.

Who Is Responsible For Govt. Property?

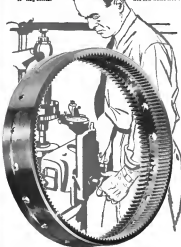
A contractor is directly responsible for and accountable for government property involved in a contract.

He must maintain and make available to appropriate government agencies such records as required, and must account for all government property he has received until relieved of this responsibility in accordance with established procedures.

Liability for loss, damage or excessive use of government property will depend on the circumstances surrounding the particular case.

The division gear shown here is 5" in pitch diameter and 15" long overall.

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LESSONS IN R/T ENGINE, manufacturer's manual, 1940, 100 pages, \$1.00

Technical Team Covers World

Aircraft and Equipment Division's job is around-the-world supervision of maintenance engineering.

The primary mission of the Aircraft and Equipment Division is to ensure worldwide technical supervision of USAF maintenance engineering. The functions, divided among the branches of the division, involve the determination of maintenance engineering requirements for modernization, new designs, and retrofit programs; specifications of all work to be performed; placement of organizational responsibility for performance; provision of necessary technical direction, evaluation of results, and technical assistance in the field.

The activities are ordered for the benefit of all elements of the USAF. Consistent of course, under the official supervision of the Maintenance Engineering Directorate. Proper maintenance, and its accompanying projections toward inspection, modification, and modernization of aircraft engines, and other equipment now operated by the Air Force, is stressed as the main objective of the program.

Preventive maintenance, boiled down to practicality, means efficiency during the unknown and life of aircraft and equipment. Future major actions toward preventive maintenance has a definite place on the maintenance engineering agenda, and will be implemented mainly through the new Air Force tailored inspection system which promises to cover every complex problem not encountered by aircraft industries or commercial airlines.

The objective of industry is production. Commercial utilization of a result is conducted for transportation purposes. The needs of the Air Force cover many purposes, including combat operations, reconnaissance, and com-

dited supply and transportation. Inspection, tailored to the specific operation ahead, should ease the general workload of maintenance all along the line.

In instances like the Korean situation, where aircraft cannot be removed from combat areas for long periods of overhaul because of the immediate demand on the uncertain problem of supply and replacement, the inspection of equipment will be adapted to the needs of the moment, or scheduled to accommodate projected combat tactics, as the case may be.

Phytoplankton and zooplankton also react to shifts to new types of seston, aspects of which are chronologically far enough away from the production to be considered as a separate factor of influence on which to figure future inspection requirements before prolonged utilization has taken place. Inspection systems, which are new to the Far East, and which are being developed in Japan, which utilizes the former method of inspection, are being developed to detect intermediate stages (impurities) to the determined utilization of the seston on equipment. It is a medium to relieve uncertainty about routine inspection of the water, and to make it possible to carry out the plan, regardless of whether stored, modified, reutilized or utilized to a second stage (the end of utilization), and should in time provide extensive savings in both time and money.

• **What Streamlining Will Do—The new streamlined organization will level off responsibility to analyze reports, develop and approve retrofit programs, and write the technical orders and handbook instructions necessary to implement corrective action.**

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Here's a fastener that spins freely down to the work as bolt, stud or end shaft. Yet when proper torque is applied, nut will never loosen, even under high frequency vibration. And because it takes its shillee temperatures up to 1600° F. and down to -120° F., it meets stringent jet engine and other aircraft applications. By distributing the load to all threads, Klinger reduces the high stress concentrations and torsional load usually found in the first three threads. That, once wrench torque may be applied before exceeding the elasticity of the bolt.

Examples are invited regarding unsolved technical problems. Write to date and sample, let us know the use and application. Address: Page 1100-00.



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Meets Air Force—Heavy Aeronautical Standard Specification MIL-C-6055

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will be revised to incorporate the most recent changes as they appear in production and are recommended for operators.

Keeping Up-to-Date—An example of this program is modification of the flight simulator concurrently with modification of the type of aircraft it represents, as the aircraft is changed in production. Modifications, corrections already have been applied to the new trainers for the F-56 and B-47B aircraft. During World War II, in most instances, pilots took out of training school found, when subjected to operating units, that the types of aircraft assigned for operation were many months ahead of the aircraft in which they had been trained. Lack of up-to-date training instructions and experience in handling the new aircraft led to serious accidents, fatalities, and complete destruction of quantities of equipment. The conditions impossible to handle during the rush of war will be alleviated by the new methods of retraining concerning the instructions for training and operating present aircraft.

The rebuild (modernization) and modification programs already in use have been planned, since instructors, now being brought aircraft and equipment up to current practical requirements and to correct operational deficiencies disclosed by the service activities during operation and inspection.

Because of Size—The outlook for a rapidly expanding Air Force influenced the slow and cautious approach made by Maintenance Engineering in establishing its engineering technical program on a solid base, recently. It was evident that the problems of experience would bring heavier problems in maintenance which, if approached at too great a speed, could cloud the horizon for some time to come, unless the big in common normal production and the critical shortage of materials and tools could be overcome.

Increased strikes in industry, increasing weather, and an overwhelming workload all delayed action on other phases of engine modernization and modernization at a pace. Aircraft and Equipment Division has a double workload ahead in figuring requirements for a flying defense that will almost double the equipment, while extending its activities and responsibilities into new fields of maintenance. Preliminary decisions must be made by the technicians who concerned new features in design, production, and methods of operation, and instructions must be written for these.

Control of technical instructions and the overall instructions of hundreds of various procedures to be implemented for emergency conditions or unforeseen situations, while formal and other procedures technical orders are under process.



B-47B

FLIGHT SIMULATOR

world's first
jet bomber simulator
engineered
and built by



can, require well-ordered thinking. The placement of technical discipline and evaluation of results provide the minority of technical guidance.

► **Proper Balance**—It requires the proper balance between pilot and airplane for successful completion of a mission. The technical training behind the instructions for both the pilot and the machine who maintains his aircraft provides this balance.

A general handy crew, capable of fixing anything with old bits and pieces, has no place in the preparation of aircraft for record service in the air, without proper training, AMC believes. The great money on the runway follows a technical authority that guides his daily

tasks in whatever technical detail he performs. This detail is the standardized technical order that directs use of standardized tools for installing standardized parts in standardized aircraft.

This point is especially fearful when one considers that Air Force modernization and rebuild programs often cover hundreds of aircraft, hundreds of tool bits, and thousands of component parts. The result is that all mechanical efforts of the Air Force are accomplished in the same fashion, whether in the Air Materiel Command Headquarters at Wright-Patterson Air Force Base, Ohio, where the instrument originates, or at any of the other hundreds of Air Force bases. Variations are permitted only on

special authority through appeal to the decision makers back in the Aircraft and Equipment Division.

► **The Unknowns**—The director of this guidance in the maintenance technique, so far back behind the stage of operations that generally he is unknown. However, the pilot on a routine flight is some part of the United States can rest assured that the plane he operates is assembled and maintained in the same fashion as the one of the same type he left behind him after he knows comes down into MRC alley. The gradually developed methods applied by the Air Force in housing the factors of standardized efficiency have been studied after long and sometimes painful periods of analysis and research toward improvement in maintenance service.

The most integration of approximately 12,000 Army technical manuals into the Air Force long-range technical order system was intended to avoid duplication of effort in compilation of the same information for common stress now utilized by both services. The new responsibility includes maintenance of railway rollingstock, such as flat cars, locomotives, and engine repair equipment, fuel tanks, facilities (middle baggage), heavy construction tractors, draglines, motor patrols (graders) and shovels.

This responsibility, brought about by the division of assets under the unification program, will be taken over by the Air Force through the Aircraft and Equipment Division which will give its substance to the Department of the Army on technical service equipment. Until the division of assets has been completed, the Army Department of Engineers will continue to purchase such equipment and perform depot maintenance for engineering equipment utilized by the Air Force.

► **Target Dates**—Target dates have been established in 1955 and 1956 for the complete unification by the Air Force of all engineering type of equipment utilized in its support. As the program advances, the technical manuals, some of which date back to before World War II, will be rewritten to Air Force requirements.

The task of adjustment indicates how the long arm of unification has extended to two other Departments of Defense toward an increase and joint publications, revisions to aircraft and engine component of both services, were adopted by the Air Force and the Navy during the last war and are still in effect. The known necessary to complete these publications provides a technical meeting ground between the involved services, and often includes further coordination with the Signal Corps, the Air-Aircraft Service, and with Reserve, National Guard, and Civil Air Patrol groups.

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cuits from Arma are an integral part of many of America's most advanced weapons. In fact, research, design, development and manufacture Arma Corporation has worked in close cooperation with the Armed Forces since 1918—and more recently, the Atomic Energy Commission, Arma Corporation, Princeton, N. J.; Missile, A. I. Laboratory of American Bosch Corporation

ARMA

ADVANCED ELECTRONICS FOR CONTROL



► **Field Visits**—The assistance rendered by team, frequent field visits of technicians and component checks of the mission to depots and Air Materiel Areas all over the world, as well as its extensive facilities in the continental United States, is intended to improve the reliability of instructions and have them on a realistic current demand. Through such personal contacts it is also possible to detect minor differences in equipment that might not be reported through formal channels. It is expected that field visits also will assist in disclosing weaknesses in equipment through conditions before the stated equipment has reached a stage too critical for this action.

The Aircraft and Equipment Division also monitors the overall contractor output, improving the workable process for technical representation and covering methods for applying constructive technical instruction in training or operation as it may be needed.

The "tech rep" system has solved many situations in which the Air Force, through shortage of available trained personnel, has found itself unable to implement programs involving highly technical equipment after it had been furnished.

In these instances contractor personnel are assigned wherever they are needed to assist in the original engineering installation of equipment and to continuously train military and civilian personnel in the operation of it as they go.

More technical representatives are assigned to work for indefinite periods, extending from weeks to years, in Air Force installations as official representatives for their respective industries on the handling or modification of their employees' products. Frequently these personnel are the spot men with responsibilities as the Aircraft and Equipment Division has saved the Government a heavy workload of correspondence while major changes are accomplished in the equipment.

► **Voluntary Cooperation**—Furthermore, practice of "tech reps" during installation of equipment in on the scene of operation has also led to the manufacturers making voluntary changes or corrections in complex designs not projected for wholesale application.

As the Air Force adheres to its goal of greater, more and more assistance from tech reps will be needed to substitute in open competitive technical arguments of the Civil Service until adequately educated or trained personnel can be secured.

The functions of the various operating branches which, in addition to the major plans, operations and administrative offices, comprise the Aircraft and Equipment Division are described as follows.

Aircraft Branch

The primary mission of the Aircraft Branch of the division is to prepare technical instructions for the service, defining the approval methods and procedures for the maintenance of aircraft and component stress consisting of airframes, electrical, hydraulic, and pneumatic systems, heating, ventilation, fuel piping, engines, in flight feeding, anti-icing and de-icing systems, instruments, automatic flight controls, photographic equipment, etc.

To do this job requires the knowledge of necessary changes to manufacturer directives to correct adequacy and

accuracy, the providing of technical assistance to service activities, the monitoring of reports regarding unsatisfactory performance of assigned equipment, the determination and initiation of corrective action, the evaluation of new aircraft and equipment, and the participation in joint meetings with other elements of the Armed Forces and civilian agencies on maintenance system concerning the equipment delivered to service activities.

Attendance at provisioning inspections (final and check-up inspection of aircraft and equipment) conducted by manufacturers is a major assignment in the acceptance of newly designed ma-



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From the design and engineering departments of Ryan Industries have come many of today's most important developments in aircraft accessories and parts. Ryan is proud of its role as a key source of supply for the United States Air Force—and deeply aware of its obligation to maintain continued progress in the design and engineering of these items so vital to this country's air supremacy.

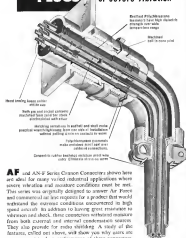


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AF and **AN-F** Series Cannon Connectors shown here are ideal for many varied industrial applications where severe vibration and moisture conditions must be met. This series was originally designed to answer Air Force and commercial air line requests for a product that would withstand the extreme conditions encountered in high speed aircraft. In addition to having great moisture resistance and shock, these connectors withstand moisture from both external and internal condensation sources. They also provide for easy disassembly. A study of the features, called out above, will show you why ours are enjoying outstanding performance of these connectors. The machined ball-on-rod joint, while not obvious, plays an important part in providing extra shock and vibration resistance. For engineering details request Cannon's AN Bulletin.

The Cannon AF Series consists of 2 plug types and 3 socket types in 12 different sizes. Contact configurations range from 1 to 12 pins. The AN-F Series consists of 1 plug type and 3 socket types in 12 different sizes. Contact configurations range from 1 to 12 pins. The AN-F Series consists of 1 plug type and 3 socket types in 12 different sizes. Contact configurations range from 1 to 12 pins.

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Since 1912



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has recently separated from the Equipment Branch. The separation was in direct line with the long-range program aimed at the Air Force in minimizing its own types of engineering equipment and mechanical service equipment for early maintenance by the army.

The branch is responsible for providing mechanical advice and assistance to all elements of the Air Force on construction, modification, and reconstruction of the numerous items of Air Force equipment now being delivered for direct maintenance, such as engine and fuel, engine, and special purpose vehicles, aircraft support equipment categorized as crash kit and rescue equipment, general purpose vehicles, aircraft and auxiliary power plants (airborne and ground-support types), and various equipment such as Diesel gas engine sets, and turbine equipment. Many of these, particularly the engine rolling stock, are to be completely turned over to the Air Force in 1953 and 1954.

With the steadily increasing air, engine, and turbine equipment, the branch is destined to play a major part in the overall support of the Air Force. The program of reconstruction for Diesel gas engines requires special training for large numbers of men, and will also play an important role in the country's defense.

Property Mixing Sometimes Okay

Government property, and is particularly material, must generally be segregated and kept physically separate from contractor-owned property.

For convenience of government and protection of property, a contractor's plant and other facilities:

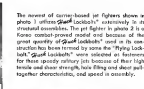
- When a production line is engaged with government work. Usually, no special provision is needed for segregation of government special working and plant equipment with the contractor's property in a case like this. But the contract administrator may prohibit it at his discretion, if such segregation is not considered in the best interest of the government.

- Government furnished, special working or plant equipment, held in storage by a contractor pending its use under a production contract, may be segregated with contractor property if the contract administrator gives his consent in writing.

- In connection with research and development contracts, when approved by the contract administrator.

- Any reworking may be permitted by the contract administrator upon approval of the requesting government department, in accordance with departmental procedures.

Can You Name ... THESE PLANES OF TODAY AND TOMORROW?



The modern jet fighters pictured in illustrations 3 and 4 have increased rigidity and stability in deflection resistant joints which are made possible by the hole filling characteristics of *Huck Lockbolt* when driven in interference holes. Also, *Huck Lockbolt* not only does a better job but they have a lower installed cost than most fasteners approved for aircraft use. More and more modern aircraft manufacturers are utilizing *Huck Lockbolt* and *Blind Rivets* wherever quality, strength and economy are essential factors in assembly or maintenance of the high speed planes of "Today and Tomorrow."

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Huck Lockbolt, *Blind Lockbolt* and *Blind Rivets* are approved by the United States Air Force "Air Material Command" and the United States Navy "Bureau of Aeronautics" for use in government aircraft structures.

1. **STELLAS-170** (Dresser Vought Aircraft)
2. **SHOOTING STAR-170** (Lockheed Aircraft Corp.)
3. **EDGEWORTH-170** (Lockheed Aircraft Corp.)
4. **BANER-170** (McDonnell Aircraft Corp.)

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Now the AF Keeps Them Reading

Publications Division turns out over 3 billion pages a year to provide USAF with technical know-how.

An appetite for reading doesn't make you a "nerd" in the Air Force.

Our nation's primary air arm is placing great emphasis and reliance on the printed word to provide technical "know-how" for its personnel in a fast changing environment.

Complex and rapidly changing equipment, comprising almost unmanageable thrust, has made it necessary to develop a large but remarkably flexible technical publications system. At present, more than 15,000 active publications, most of them subject to frequent revision, form the unique Air Force technical publications system.

Development and maintenance of this publication enterprise rests primarily with the Publications Division, Directorate of Maintenance Engineering, Headquarters Air Materiel Command. It is the seat from which more than 15,000 separate publications writing projects are generated annually, including the issuance of thousands of technical writing agencies as well as the technical writing staff of numerous Air Force technical units. At Air Materiel Command, the Wright-Patterson Air Development Center and those in numerous other military departments.

Operations of this vast and far-reaching technical publications system add to the Publications Division's work responsibilities that of those of some of the nation's largest publishing houses, including control over the printing of more than 5 billion pages annually. The Air Force's expenditure of material is equivalent to a 157 million high class (as of standard 8 1/2 x 11 inches) sheets of paper.

Printing Plants—The printing capabilities of the Air Materiel Command rest on printed plant facilities at its head quarters and most of the Air Materiel Activity. To augment this capacity, non-regional facilities are used extensively. In addition, approximately 246 million pages of technical material are applicable to the Air Force is obtained from the reproduction sources of other military departments.

Despite the enormous volume of printed material issued each year, it is well controlled through a carefully established filing system placed under the close scrutiny of air inspection found in the great majority of Air Force units and installations. Actually, one of the pressing problems of the Publications Division is that of clearing better air copy of the condition now is provided status of Air Force equipment for Air Force personnel engaged in operating, maintaining, inspecting and supplying

the equipment.

In the early days of the Air Force, technical data support, while important, was relatively small due to the limitations and simplicity of equipment. However, with a vastly expanded Air Force utilizing extremely complex equipment, publication support has become big business. Some concept of the expanding requirements may be gotten from the fact that more than 1,100 separate publications are required to support a modern B-36 bomber, with an installed equipment and related ground handling and test equipment.

The Headquarters—One of the Publications Division's primary responsibilities is the establishment of publication requirements to provide this type of support for Air Force assigned equipment. This intensive support is in the form of Air Force technical units responsible of handbooks, each designed for independent usage by personnel assigned either to the operation of equipment, the general maintenance and overhaul of equipment or supply support. Further aids are provided in the form of many types of maintenance publications.

A large percentage of this technical literature has its origin with the military branch of equipment. These drawings, procedures, etc., is prepared in a form to permit immediate reproduction and subsequent distribution to organizations operating in Europe, Korea, and remote corners of the globe.

The format, illustrative arrangements, and specific contents of the various types of technical publications are set forth as specifications that become part of the contractual requirements in the preparation of publications and used to establish the necessary uniformity and adequacy of these publications.

A total of approximately 425 military and civilian personnel discharge the responsibilities of the Publications Division at Air Materiel Command. Organizationally, this Division is composed of the office of the Chief of the Division and the Chief Publications Office, together with the staff complement of personnel who carry on staff functions relating to administration, plans, and operations, plus five operating branches.

Requirements Branch

Primary mission of Publications Requirements Branch is to conduct necessary research and coordinate with maintenance technicians in deter-

mining requirements for publications. This action is taken when a previously issued document is needed for processing. The item of equipment being purchased, whether it be a complete aircraft or a small valve assembly, is discussed with supply and maintenance technicians to determine if there will be a service need for technical data. When a requirement exists, a further determination is made as to what handbook specifications would be applicable or whether conventional data as prepared by the contractor will suffice. These data requirements are then included with the equipment purchase request which the processing agencies forward into a formal contract.

Requirements established for procurement of data either directly from commercial sources or through other military services are made a matter of record and periodic checks are made against the processing service to insure that required data will be delivered concurrently with equipment to which it relates.

Contract Branch

Following procurement action for publications, the Contract Publications Branch enters into the next phase of processing handbooks from Air Force contractors, by passing the Air Procurement Division in their work with the equipment contractors.

This branch also manages contracts with prime equipment manufacturers for maintaining handbooks in current condition when out-of-date information is involved. Work of this type has been done by technicians at Headquarters Air Materiel Command for a number of years; however, the huge number of books involved and the pressure of other staff work now precludes the maintaining of these books in current condition at the headquarters. At the present time approximately 50 equipment contractors have contracts with the Air Force for this new type of handbook service.

A primary responsibility of the Contract Publications Branch is that of preparing and coordinating the specifications governing format, style and specific technical coverage, to insure uniformity in all of the technical publications.

Editorial Branch

The Publications Editorial Branch of this division performs the necessary editorial and art work incident to preparing a technical publication that compares with the Masterpiece Encyclopedia Directorate. Recently the work involved consists of developing rough draft copy, furnished by technical con-

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ponents of the Directorate, into final reproduction copy along with selected air work. The resultant publications may be either handbooks, parts catalogs, modification directives or publications of a procedural nature.

The majority of the publications processed deal with the normal maintenance functions on combat aircraft. However, emergency situations are covered by time-compliance and other directive types of technical instructions requiring immediate attention by operating activities covering modifications, operations, aircraft maintenance practices, and grounding of aircraft. Usually, publication of this type are of an urgent nature and require expedient processing with great rapidity.

The Indexers

The Special Publications Branch is primarily concerned with the preparation of very necessary index pages of publications. These consist of master index, alphabetical indexes, an equipment index for use in airplane distribution of technical publications, and lists of publications applicable to specific aircraft or special equipment. The numerical and alphabetical indexes are essential items for identifying desired publications. The need for this type of data can usually be appreciated when the 25,000 publications presently in the system are considered.

A related function of the Special Publications Branch is proper assignment of publication numbers for Air Force handbooks prepared from contractors and the applicable publications issued by Departments of the Navy and the Army. This branch also serves as the contact point for the exchange of technical data with other military services.

Printing Branch

The Printing and Reproduction Branch has enough resources to perform practically any type of reproduction work classified as printing. This includes linotype work and other types of composition. The production capacity of this plant is approximately three million 14 x 22 inch pages per eight hour day. Reproduction is accomplished on equipment ranging from a simple office duplicating machine to complex two-color offset printing presses. In addition to the printing of technical publications, the plant reproduces all manner of applications, other instructions, charts, graphs, orders, and all the items of special publications received by the various components of Headquarters, Air Materiel Command.

It is the practice of the Air Force to reproduce all individual publications by offset printing, so that reprints can be returned for subsequent reprints.

Supply Directorate: Source of Logistics

- **AMC's primary job is to supply the Air Force.**
- **And the pipeline starts in an electronic brain.**

On a certain fateful second, an Air Force jet pilot will get a MIG squarely in his sights. The next few seconds, maybe three, maybe 20, will tick off the minutes of the contest.

At another instance, a bomber will drop its lethal cargo on a pinpoint target with the words, "bombs away."

A few hours later Americans will stand at their hotel balconies that "Inter Com" commands jets were downed in the last air action; and "casualty notifications" south of the Yalu River were bombed into today.

These tactical operations will seem pretty simple to them. They can picture the well-trained pilot dropping into his F-86, taking off, finding the enemy and eluding him. They can see a bomber squadron high above the Chinese ammunition dumps.

As men savored all the story details, these elements of combat don't seem closely to the myriad details of the nation's air war effort.

It's **Big Business**—Actually, it takes the largest business in the world to plan the loaded bomber and the standard F-86 on their landing strips, ready for takeoff. And to equip the pilots and crews for their swift tactical missions.

This is the business of the Air Materiel Command. AMC performs the physical task of providing the pilot with the things he has to have for those relatively few moments of impact on the body of the enemy.

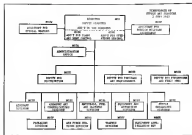
These things include some very personal human needs.

• **Food and clothing** for the pilot. For his work clothes on the job, he'll wear a flight suit and pressure suit. He'll eat on a parachute. It's essential that he has an airplane which performs about as well as the enemy's and has comparable armament. To obtain these needs will be some modification.

• **A badge, strip and an address** somewhere south of the 38th Parallel. That line will have to be able to perform actions which maintenance jobs. So there will be both at the base.

• **Lots of fuel and know-how.** To fly an enemy in North Korea the F-86 will have to turn south.

All these things are not to be found growing on Korea's soil. They have to be brought across the Pacific from America to be stocked against every calculated need.



Support Logistics—Over here, the electronic brain, the index, the airplanes, the accessories and the fuel had to be bought and tested. They had to be placed where the Air Force could grab them in a hurry. That calls for a workable stock record system and efficient warehousing. Speedy methods of shipment had to be worked out, and safe, convenient packaging. Transportation and routing had to be studied and bought. Ticks of cargo planes and vehicles bought and maintained.

Then man had to be employed to perform the work of war, often highly technical, involved in these tasks.

In military parlance, all this is the work of logistics to support all tactics. To do this on the dictionary, means "behavior in the presence of the enemy." Logistics bend down closely to "apply and execute to the force in the field."

The people in AMC's newly created Directorate of Supply and Services, believe their functions are almost to fitting the overall definition of logistics. There is the job of delivering goods and personnel services to the place where the trigger is pulled.

The people who work on desk jobs at AMC Headquarters near Dayton see their task reaching even beyond the tawdry tables in South Korea. They see things riding with the jet pilot and the bomber crew. They feel as close to the pulse of combat as the cuff on the flyer's pressure suit.

The very complexity of the work of Supply and Services makes it hard to conceive how such a vast, shifting operation

can keep pace with the exigencies of the modern war.

How can this whopping job, outposts of men, commands, procurement districts and depots make its necessary paperwork fast enough to meet such emergencies?

How's it Done—Maybe it would be easier to tell what can be done than how it's done.

Many times across the notebook of the known war, Supply and Services has been able to deliver its goods almost as fast as the Air Force can deliver bombs.

An assistant to Brig. Gen. Louis B. Parker, chief of Directorate, discloses: "We can beat 72 hours on hot items that can be caused by surprise. In Korea, that's from the time the original request was made—when the need was discovered—on the moment of delivery to the Korean airbase."

Now, let's trace this delivery.

• **Buy** that at a Korean airbase it is found that a changed ticket requires a new piece of an equipment. The base supply is zero on this item.

• **What**, just, like almost every other part in the Air Force stock, has a catalog number and nomenclature. The method of getting it is through a requisition form. The form is filled. This requisition is translated to a punch card in a business machine. The card electronically prints an message on a teletype tape.

• **That** message is flashed across the Pacific by radio teletype. Within the second it is received at the Defense Control Dept. There it is retrans-

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vated electrically to a punch card.
• The request goes by teletype to a paper depot, possibly in Ogden, where the data should be checked.
• Suppose that Ogden doesn't have the part. A quick look at AMC's worldwide stock balance on this item tells Ogden the part can be supplied by the Mobile ship. The teletype station to Mobile then is called an extranet.
• Once the part is pulled out of stock, shipping papers are made at Mobile to the paper steel plant. The article is packaged, put in an air carrier and forwarded to the nearest shipping point.

In this case, the bulk of the time consumed in filling the order will be the flying time across the vast stretch of the Pacific.

Actually, there's a lot more to the shipping process than this brief sketch tells. More of that later.

The strictly account of rush order treatment was given merely to show how Supply and Services, with the aid of modern electronics, can speed its "paperwork" faster than the merest jet can fly.

If it has to be so.

Supply and Services prefer not to do business that way.
► Anticipate the Needs—Much of the thinking in the Directorate's headquarters is aimed at avoiding the need for rush-order anticipating requirements so thoroughly that the aid of the personnel transportation, with its personnel costs, can be forestalled.

These AMC Supply and Services people are not "longhairs." But there is some high level thought behind their down-to-earth functions.

The observer sees the Directorate going about the prosaic business of getting needed goods and services to their "customers," the other Air Force commands. These goods flow through the AMC supply system in various ways.

In some cases property is sent out to the customer in the traditional parameters of the old time Army requisitioning. In other cases, something like a private retail business is set up. Sometimes supply operations resemble a mail order house. One phase of services is like a super-chain restaurant.

There's nothing static about this huge business. Methods and procedures may change overnight, when somebody discovers a new way to save time and dollars.

The steering of this massive phased operation is in the "headquarters" of the AMC headquarters building. There, in Gen Parker's office, the planners and top administrators apply an ever lit philosophy to the complex job.

► Buy Time & Distance—Then philosophy sounds at first like something out of Einstein until they relate it to practical applications.



GEN. PARKER: Paperwork can be faster than a jet

A civilian assistant to operations control, with it this way.

"We buy time and distance."
"And we're here to make a business of it, measured in nearly as possible by the same yardstick of economy you'd apply to private industry. We want to deliver as much as we can, per mile and per hour, for a dollar."

The concept of buying time and distance sounds a lot vaguer until the spokesman cites an example.

Suppose, he says, the Air Force has to buy a certain tactical missile. And suppose each missile is that bomber has to be overhauled every 250 flying hours. Let's say that with normal procedures it takes 180 days for each engine to arrive the necessary items in overseas areas through overland at the U.S. and back to its base.

If it is indeed questions it has been known that it takes three years to replace any single engine over the 180 day period, we will need 34 engines for each bomber. While six are installed, 18 will be coming through the overland pipeline.

As there is a tremendous dollar investment in engine inventory, AMC does not follow standard operations. To reflect this investment, AMC has worked out management, production and traffic controls in an effort to treat the pipeline time.

In this way AMC cuts the cost of time and distance. This reduction may be so great that only 12 engines will be needed to support the bomber. And if these engines cost \$100,000 each, AMC has saved \$500,000 on each bomber in the hypothetical case.

This policy is being followed in every high cost or critical area, the AMC spokesman says.

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the Administration office and Deputies for Distribution, Programs and Requirements, and for Procedures and Field Operations.

These organizations are so closely knit that the activation of a single wing in the U. S. Air Force will activate all of the depots' offices and right of the main divisions.

Command work, the Directorate can process approximately 37,000 people.

Its stored storage space, a warehouse, covers to 39 million square feet.

During fiscal year 1952, its catalogs listed 768,926 different items for the Air Force.

In the last fiscal year, ended July 1, Supply and Services handled some 4,310,000 tons of materials. It processed 57,038 (71) items in the same 12 month period.

The Directorate had those totals as hand books July 1. The totals came from the AMC worldwide stock ledger and consumption report and the AMC supply activity report which are compiled quarterly.

U. S. Zone—In Continental United States, AMC divides its Supply and

Food for almost cost the Service Division over a quarter of a billion dollars last year. This did not include the cost of acquisition or handling.

Service function into two areas. The buying line, roughly in the Mississippi river.

In each area there is a group of depots which handle all "things" of Air Force property. In other words, not of the most a cluster depots can supply from their stock, everything which is purchased by the Air Force. West of the Mississippi another cluster handles that which stock.

Property Classes—A "property class" embraces all things which have a cost and purpose or value. Class 25B for instance, stocks office supplies, Mc pens and paper, which commands are used in military business. Class 25A stocks furniture and business equipment—cases, permanent fixtures. Class 10C includes such photographic supplies as film. Class 10D includes motion picture cameras, projectors and processing machines. And so on down the list.

There now are 241 property classes and subclasses of property in the Air Force Supply system.

These range in magnitude. They include all types of airplanes and their parts, guns, vehicles, boats, fuel, huge specialized transport equipment, and metal shops and tools of every kind. Even dams.

The Air Force is a big spender in the defense market.

But the dogs are not kennels or fed

in lead dogs. They're kept in the Far North. You say, these dogs are leaders, bought and raised for their independent service to the isolated Air Force depots in the Arctic.

AF Depots—in the East Zone the 241 property classes and subclasses of goods are stored in nine depots. These depots vary in size and in the number of property classes.

Nine depots in the West Zone also divide the property classes.

Of these 18 depots, nine are called "prime" depots. The prime depot has worldwide control of the property classes it stocks. There are five prime depots in the Mississippi, five in the West. The other nine are called simply "area" depots for given classifications.

For instance, in the East Zone the William Air Force depot at Shelby, O., is the prime depot on clothing. Its supporting depots in the West Zone is Merwood, Calif.

Like other primes, William occupies the worldwide requirements for its property class. It has all clothes and is in charge of their worldwide distribution. This is the way under decentralized action. Formerly, the buying was done at AMC headquarters.

Now left are Air Force acquisition rules on William for as retroactive amount of shirts and William doesn't have enough to fill the order. William checks over the stocks in the East Zone. It has the stock balance report from (overlooked) to see if there is 1 surplus. If not, it draws from this surplus to fill the order.

If it can't gather up enough shirts this way, William "requests" the deficit to Merwood, the supporting depot in the West Zone. Merwood now has to search over the West Zone to find enough shirts to fill the requisition. And how, the requisition is filled, and with less far than might be supposed, considering that all Air Force installations in the U. S. are now to be supplied over. The nature of electronics has made the job easy and swift.

Communication Web—For instance over Air Force depot with AMC headquarters and ocean members in a network of radio and teletype stations which make orders for needed supplies and services. This communication web, linked to business machines, gives Supply and Services not only a swift channel for requisitions, but provides tables and statistical data.

This network doesn't belong to Supply and Services. It is operated by the Statistical Service division of the Comptroller's office. It works for Supply and Services just as it works for the other divisions of AMC.

It is so centered over center in the linkage between AMC's stockpiles in America and the Air Force's overseas missions.

Overseas Shipments—Overseas shipments are handled through three Overseas Control depots at Sacramento, New Orleans and Newark, N. J.

A Sacramento depot with shipments to Alaska, the Far East and all Pacific areas.

New Orleans handles those to North Africa, Puerto Rico and the rest of the Caribbean.

Newark accounts for the northeast, England, Continental Europe, Russia, Greenland, Iceland and The Azores.

This monitoring job means the receipt and forwarding of overseas requisitions to their proper depots, selecting the method and time of shipment and its

"case and status control" over shipments once they leave the American shoreline.

Critical Issues—"Hot" shipments go by air. These are shipments which have been assigned a high priority by the overseas requisitioning agency. They come into the depot by radio teletype, and they are forwarded to the supplying depot by teletype very early.

Other shipments, not quite so hot, may be made by "mailers." This involves to insure cargo. It's a method of giving a special treatment to certain items in a ship's cargo.

Explicitly needed items are "top-loaded" on the ship's deck, so they can be unloaded in a hurry.



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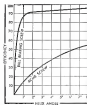
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A report that is drawn up at an Air Force depot is forwarded to the 30th Air Force Depot.

From there it passes to Fairbanks, the Fair Bank Material Command headquarters in Japan, and to Sacramento and the shipping depot.

► **Delivery—Inspection.** The shipment by the depot is covered by a new Air Force delivery insurance program. This is called "one and then control."

When the shipping depot packages an overseas consignment, it labels a lot to each shipping case showing just what items are in that case. While it does this, it sends a "one and then report" to the overseas base where the stuff is required. An inspection copy goes to the Overseas Control Depot for the Korean theater, this depot is at Sacramento.

Both overseas and at Sacramento it's known exactly what items are in the way, what cases they are in, how they are being shipped, and when they

There are 155 item consignments and 131 sales consignments under the Services Division.

leave the report or the water port. Also both places know the route to be followed by the airplane carrier or the ship.

Not long ago the Air Force lost a 5,000 ton cargo when a freighter bound for Japan struck a reef.

The San Francisco Port of Embarka then caught the news of the disaster by teletype. San Francisco field duplicate consignment lists (these lists are handwritten) to the Overseas Control Depot at Sacramento. Within two days a duplicate shipment, in identical cases, was made to be loaded aboard the next freighter headed for Japan.

► **"Bags" Get In—Hot** overseas ship reports, which often get canceled scrutiny at Supply and Services post administrative levels, sometimes bring out storage "bags."

These was the matter of auxiliary fuel tanks for Korea.

The long range mission of F-4 and F-4E jets and their outstanding fuel needs brought about a critical situation. The North Korean landscape was cluttered with dropped tanks, but they were a scarce item in South Korean stockpiles.

In a narrow business line The Supply and Services headquarters took a hard. Procurement schedules were revised upward. The two nine-item items who were supplying the tanks were alerted to which out their product as fast as possible.

The assistant to the director required that every day a report showing the number of outflows of tanks shipped to the Air Force be each manufacturer

would be placed on his desk.

"I figured that ought to be enough," he said. "I know the dimensions of the tanks and of a house. A house is eight feet wide, eight feet high. So each day I could tally the exact number of wing tanks we had coming, and add up the totals—I thought."

One day his figuring blew up in his face. He learned from the part of an inventory the number of tanks it had received from Manufacturer A and Manufacturer B. The total was 10,000. He short of the number he had computed. "I yelled that we'd lost those tanks," he said. "We'd have to find them. They had to be some place."

In the probe that followed, Jenkins found his answer. There were no lost tanks. They never had been made.

Manufacturer B had shipped his tanks in a bulkier box than Manufacturer A built. He could find a box only two tanks high, two tanks wide.

Very soon thereafter, Manufacturer B got a visit from the Packaging division. As a result, AMC worked out a considerable savings in freight costs between the plant and the depot. There was another savings ship that the reduction in cargo for the overseas shipment.

Air Force officials have looked over this business of packaging through many a sleepless night. The program they have set up to cut down the weight and cost of packaging is described on p. 172.

► **Changing Account.** Not long ago, the secret in Supply and Services was exactly in Supply. Services, such as the routing of materials to the area of concern, were considered small incidents. But, like Packaging, Traffic has stepped to the front in an important consideration in the Air Force's overall logistical planning.

Large among the department's new divisions is the Air Force Services Division.

The organization looks after the individual needs of the service, wherever he happens to be.

Whatever he aims is an object of Service's scrutiny. It checks his equipment and supplies to find out how they fit his body. It grants him through a scientific study program an anatomical survey.

It does his laundry. It handles his personal expense demands. In the U. S. it looks after his financial arrangements.

Services division has the answer to "How much can an airman eat?" It feeds him.

The individual soldier can't compete with a jet engine in fuel consumption, but he does a workmanlike job. Service division finds the actual cost of fuel for use is over \$240 million a year.

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It contains nearly 1,500 drawings of varying sizes and layouts. There are 55 central sheet-cutting plates. There are 75 gassy balloons and 55 band balloons.

There are 155 more connectors and 131 side connectors, and four various substitute supply points.

Re-Cutting job. Almost in the middle, inside view, to meet, the Air Force, through Supply and Service will be building one of its largest technical aids. Rebuilding its large models to comply with a new law signed last month by President Truman.

This law will be enforced through a standardization act which sets up a requirement for a standard cataloging system covering all federal agencies. This law will be enforced through a government cataloging agency. It will set the various standards for the Air Force, Army, Navy and every other federal agency which keeps and distributes materials.

The agencies under the law are: The Air Force, Army, Navy and every other federal agency which keeps and distributes materials.

Rebuilding of Air Force stock will probably require the opening of every stock under real normal. This will be a Supply and Service project.

any or all of the agencies are lumped into groups. Under these groups are various classifications.

Each item, regardless of classification, will be given an identification number.

The number will replace the present Air Force stock numbers, as well as the Navy's and Army's numbers. They're all different.

The scheme is to avoid duplication. It is designed to work like this: Every single thing bought or handled by government agencies will be listed under its own identification number in a master card file catalog.

From this card the back catalog can be made. The book making would be split up. The material the Air Force might make books on airplanes, birds and space. The Army would do the book on politics. The Navy recently would compile the book on shipping equipment and supplies.

So far, the plan is still in motion. Nothing has been made. But the new standardization is bound to have an impact on the Air Force stocking as far back as the last labels in a warehouse. It probably will require the opening of almost every inventory under and around. It's still too early to estimate the extent of change.

But Supply and Service officials say they'll roll with the punch. They're used to extraordinary jobs.

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AN 300A WALL MOUNTING BRACKET



AN 300A STRAIGHT PLUG

Supply data on Monowatt Wall Mounting Brackets and Straight Plugs allows easy access to stock for ordering and inspection. Shown above is just one of many types you can be ordered quickly with a small standard for removal of stock. With this one type shown and Monowatt's complete set of drawings it is possible to see a solid standard in operation which would otherwise call for a split sheet. Extra weight and precise loading of standard parts under stress is shown.



AN 3000 ANGLE 90° PLUG

Shown above is Monowatt Angle 90° Plug in ready position for ordering and inspection. Stock data call forms to be removed, but stress can be drilled for safety testing.

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- ☐ Please send Catalog (44 Electrical Connectors and Wiring Assemblies for Aircraft, Ordnance and Electronic Equipment)
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HOWARD



LIGHT AND STRONG framework for C-47 fuselage is shown in model form by Col. Randolph Fink, Packaging Division chief. Box at right used in test ground shipping, storage.

Packaging Also Part of Logistics

Making containers sturdy, but light enough for air shipment is the job of AMC's Packaging Division.

Once the "biggest unrecognized business in the Air Materiel Command," packaging is now a major concern with our host and our allies.

Col. Randolph Fink is the head. His assignment is the newly formed Packaging Division. Its aim is to give the Air Force the most for its packaging dollar and to work out more efficient methods of handling the vast quantities of Air Force materiel in depots and in the field.

The same problems that have plagued these functions in the Air Force have long been apparent in industry. For more than 20 years, American industry has recognized packaging as one of its major problems. But only in the last three years has packaging been recognized as a major field of management improvement.

It has been reported that industries as large as General Motors spend as much as 21 cents of each dollar on their packaging. On the whole, packaging is considered to be a multi-billion-dollar business.

AMC's packaging division was established last March at the personal direction of Lt. Gen. E. W. Rawlins, AMC commanding general, who saw the post war industry had assigned to packaging and the tremendous gains made in this quarter.

Col. Fink and his staff have up-graded the problem in the materiel

• Materials and material may be conserved by improving packaging and materials handling for the Air Force.

• Tailored guidelines and standards must be given to other Air Force and field activities.

• Delivery problems must be put in a secondary category with the view that material and money savings can be made right now through concrete action application of new packaging and materials handling principles.

• Four Branches—Operating representatives of the new packaging division are the packaging, inventory, cost-data and materials handling branches.

• Packaging Branch designs new containers, standardizes containers, leads technical supervision in certain Air Force packaging activities, and is responsible for corrosion control, preservation and packaging of Air Force supply items.

• Cost-Data Branch suggests proper balance between the cost of packaging and protection requirements.

• Services Branch gives the Air Force technical assistance on packaging problems, prepares technical publications and develops standards for storage, marking, container control and preservation.

• Materials Handling Branch functions include leading technical information (Continued on page 173)

AMC Experiments in Better Packaging . . .



THE TREATMENT given this container is about what it might receive in service. A device made to secure the shock.



RESULT of container impact is read on instrument.



ALL-AROUND tests let truck handle 45 deg.



FULLY PACKED

rate of shipping are cheaper to ship than large wooden crates, give better protection, and can be re-used.



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on materials handling operations of the Air Force and assisting in the planning and layout of Air Force parking lots, taxiways and runways. The branch also develops unit loading systems and monitors materials handling personnel for lifting bags, slings, jacks, tie-down and chocks.

■ No New Functions—In forming the Packaging Division, Col. Fink pointed out, no new functions or responsibilities were assigned and no additional personnel were required. The new division simply brought together tasks which he long felt were not "dual in the use" apply in maintenance facilities.

We have given the outstanding general man whom he can get a finger on for the minutes, and recognition for the good things. We have also asked him to see that the man and material make a decision," said Col. Fink. "Packaging does not belong to supply, nor to maintenance, nor to personnel. It is an important function that prevents the loss of the concerted efforts of supply, maintenance and personnel," the new packaging head commented.

He explained that the Air Force will spend more than \$1 billion next year on packaging, preserving and packing, or about 10% of the total Air Force procurement bill.

Col. Fink is particularly interested in designing containers for rapid airlift transportation. His staff, with the help of the Forest Products Laboratory, Department of Agriculture, is developing processes which containers for airlift.

In the not too distant future some of the advances the Packaging Division is making in packaging and materials handling for air cargo might change the entire logistic concept of the military services and help give commercial air cargo its place in the sun.

■ Action—Air Force Col. Fink says in trying to lighten the air cargo load in the.

"The only reason you put boxes around materials to be shipped by air is to secure the individual pieces any together and to insure against rough handling. In a sense, you should throw away the wooden box and fly the interior cardboard container."

He thinking behind packaging for air shipment is that items in small cases should not get the rough handling or jolts they would receive in ground shipment. Therefore, the air package should be just sturdy enough to "get by," with provisions for "loading up" the same package for ground transportation.

Col. Fink called upon memory to bring out the striking illustration of the experience of cutting two weight for air shipment: it costs about \$1.50 a pound in the average to fly Air Force

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Col Pack Air Port Airside Test Stand



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Pack Clincher Hydraulic Press Pack



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Pack Clincher Hydraulic Press Pack



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Greer engineers test everything from test stands, under conditions for more severe than normal operation—before it ever leaves the plant. For we know that testing equipment must have the complete confidence of those who use it. Greer engineers discover that confidence, and less it—because it has earned it.

Not many products by the multi-thousands, each Greer test stand is painstakingly engineered, and is carefully tested in each stage of production for absolute accuracy. The men who design them and the men who build them have many years of specialized experience in this narrow field. It is experience that is difficult to find—perhaps impossible to match elsewhere.

In addition to standard models, many special machines have been developed to meet specific requirements. A staff of creative engineers is always available for a discussion of out-of-ordinary problems. Write or call today, no obligation.

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residual from San Francisco to Japan, and about \$3.55 a pound from Westover AFB, Miss., to Europe.

Another major reason for riding down on air cargo package weight is the fact that the engine, tank to surface craft, runs out of weight carrying capacity before it exhausts its cargo. Col Pack and the average Air Force parcel being shipped by air cargo, a good weight about 17 pounds per cubic foot and occupies four cubic feet or less. The same item being shipped by air must weigh less, although its outside dimensions are not so important.

The average design is a cross pack, apt, according to Col Pack, weighs about two and one-half times the weight of the product enclosed. With no great difficulty, he believes, the true weight can be cut down to 50% of the item weight, and ideally, the package should weigh between 10% and 15% of the product it protects.

Applying the Theorem—This finding is being pulled rapidly out of the theory stage. Col Pack presented statistics which show how his staff already has designed packages for an shipment of an aircraft parts that weigh 40 lbs. at such a standard package is correct one.

Standard packages for airplane control surfaces, in particular, seem suitable heavy when compared to the weight of the surfaces themselves. This is due generally to the fact that control surfaces, though light, are long, flat, cumbersome items.

Turning through charts, Col Pack pointed to a horizontal stabilizer weighing 94 pounds when, when packaged according to standard procedures, weighs 549 pounds gross. An aircraft rudder measuring 75 x 24 x 6" weighs 26 pounds but adds 142 pounds to its packaged weight. Another surface weighing 600 pounds weighs 11,770 pounds with standard packaging.

Studies by the Packaging Division quickly indicated gross packaged weights from 300 to 37 pounds on one control surface, from 445 to 101 on another, and from 745 pounds to 181 pounds on a third.

A C-54 aircraft measuring 187 inches in length and weighing a mere 96 pounds tipped the beam at 912 pounds when packaged by the regular method. Packaging Division people whittled this down to 578 pounds gross as an shipment pack. A study of the C-119 aircraft package brought about a 50% weight cut in a 40% volume saving.

Strong Framework—Most of these package weight reductions were accomplished by designing a strong, rigid framework to contain the product, where the primary mechanism was to contain the air control surface in a heavy wooden box. The box can be added for ground shipment if necessary. Another device that Col Pack is

DOUBLE YOUR PRODUCTION WITH

DOUBLE RIVETERS AND CLINCHERS!



RIVETERS

For one riveter at a time with this new T-J Riveter. This machine is capable of riveting 15" diameter, and loaded by automatically feed and set two 1/2" dia. x 7/8" long rivets into head rivet at a time in aluminum plate and mild steel on standard. Controlled by one foot pedal.

CLINCHERS

For one clinch at a time with this new T-J Clincher. This machine is capable of clinching 1/2" dia. x 7/8" dia. x 1/2" thick plate steel into a head rivet at a time in aluminum plate and mild steel on standard. Controlled by one foot pedal.

Save labor . . . speed up production with T-J Riveters and Clinchers adaptable to a wide range of assembly jobs today . . . in aircraft, automotive, farm machinery, shipbuilding, of all kinds!

T-J Clinchers set clinch nuts 3 to 5 times faster! Fully automatic . . . controlled by a single foot pedal. Available in Underfoot and Gravity Feed models, throat depths 8" to 36".

T-J Riveters automatically feed and set solid rivets . . . with high production! Electrically-powered Riveter sets 1/2" to 1/4" diam solid steel rivets up to 1/4" long. Air-powered Riveter sets aluminum alloy rivets up to 1/4" diam, or steel rivets up to 1/2" diam, and up to 3/4" long. Throat depths 8" to 36".

Write for Clincher bulletin 847; Riveter bulletin 846 and 847. The Tomkins-Johnson Company, Jackson, Mich.



T-J Riveter used for automatic clinch nuts on assembly lines. One foot and labor saving in head rivet assembly, air and gravity feed, inspecting and inspecting.

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applying to a lot of packaging problems is the metal container, or can. Steps are being taken to can certain types of clothing, for example. Disposable, many instruments and smaller metal parts are starting to be canned, and one of these days the canned procedure might be standard.

Use of cans in packaging provides the perfect moisture barrier and durability scarcely possible with other types of containers. Cans eat down the instances of pilferage. If there's a food in Mission, your stored or moving products in cans can't be damaged.

Another factor about cans which is of particular value to the military services is that when the man in the field receives a canned item, he can inspect it easily, then place a replaceable item back in the original can, seal it in a self-sealing device and return it to the depot for repair.

► **Canned Bearings**—As an instance of savings, the Air Force also cannot bear being made on "canned" bearings.

Storing bearings is a definite process. You have to allow for moisture, temperature and other things which wear them a bearing off kilter. Storage and inspection procedures have been carefully worked up in Air Force Technical Orders. These "T.O.s" call for lubrication at intervals and special care to avoid dust and grit.

It was learned that despite all these precautions, the Air Force was losing something like \$500,000 a year on bearings which developed defects in storage.


Now packaging behavior there's a practical answer in *vacuum bearings*. The word can't be too much in an airtight can, packed in bakelite to knock out the last vestige of moisture.

► **Thrust Pumps**—Another innovation suggested by a Packaging Division employee is using the Air Force more than \$600,000 a year. The suggestion now is to use thrust pumps as a first step for lubrication and other light-weight, aircraft accessories to prevent the entrance of dust and other foreign matter.


The thrust pump replaces an expensive seal-free, non-corrosive, gas-proof barrier material formerly used. Costing one-fourth as much, the thrust pump is specially treated to make it acid-free.

As part of its efforts to improve packaging and materials handling for air cargo, the AMG Packaging Division is cooperating closely with the Air Cargo Task Committee of the National Security Industrial Association. Members of the packaging division are on this committee, and only in line the division held a meeting of the committee at Wright-Patterson Air Force Base.

The Packaging Division also is well represented in the new Air Force Packaging and Materials Handling Board, of which Col. T. L. W. is the chairman.



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Branch of the Administration and Operations Office. It is a service organization to provide assistance and information on procurement problems to the military organizations through the two aircraft for contractors' liaison and industrial liaison.

A Policies and Procedures Branch, a Reports and Analysis Branch and a Management and Budget Branch are any organizations within the Administration and Operations framework. Other branches handle military and civilian personnel and administrative services.

Office of Inspection—Means for the director to keep a close check on procurement actions is provided through the relatively new Office of Inspection Unit recently that had been a section in the Administration and Operations Office, but it was given separate status reporting to the director, last August.

The change was made to provide a more effective channel for the Directorate to investigate and recommend action on reports of procurement irregularities and recommendations and to permit retention of such records.

Plans and Programs Office—A current status report on programs for production and procurement is submitted to the Directorate by the Plans and Programs Office. The office has the responsibility of interpreting programs and of determining the director's capability to support programs assigned from ANAC headquarters or higher authority. Develops a Program Branch in this office, a Budget Branch maintains a continuing analysis of available funds and budget plans, acting as a fiscal control point for all activity, handles equipment and support programs.

Field Operations Office—The work of centralization program, which is discussed elsewhere in this issue, has added

to the importance of the field operations within the Directorate to such an extent that a reorganization was necessary. The new Field Operations Office, which is charged with a number of new functions, places Col. George F. Schenck in office chief, and makes Col. John G. Benson deputy director for field operations.

Members of the reorganized office are to ensure staff compliance for the director over all Air Force field procurement. A foreign procurement branch is established to keep an eye on foreign procurement activities of the Air Force, including overseas commands, air attaches and Air Force foreign missions.

Other branch reorganizations provide for supervision over Air Force unit District operations.

Procurement Committee—One of the most powerful outfits in the Air Force bearing responsibility is the Procurement Committee for the Directorate. Composed of various civilian procurement specialists, it acts as advisor to the director, and recommends new procurement policies to the Undersecretary of the Air Force as well.

The committee, headed by John Schenck, is authorized to advise every Air Force contract in the amount of more than \$100,000. It also may review any other contract of any size if it shows. Analysis of its recommendations is to require supplemental approval for revision of prices is avoided unless, when permitted by "extraordinary" action in the original contract.

Canadian Unit Agent For U.S. War Buying

U. S. Defense Department purchases from Canadian manufacturers are handled exclusively through the Canadian Commercial Corporation, except for off-the-shelf items.

The agreement, dated February 18, 1952, will extend through December 31, 1955, unless extended by mutual agreement.

The Corporation was established in an act of the Crown by an act of the Canadian parliament in 1949. Terms of the agreement between the Canadian deputy minister of defense production and representatives of the armed services in this country provide for negotiation of contract prices, where fluctuating monetary standards create hardships. The agreement also provides Canada with the responsibility of regulating exports of profit on contracts with the armed services.

All provisions contained in the agreement are subject to change at annual determinations or at other mutually acceptable times.

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Contacts rated 250 Amps Inductive, Inductive
and Motor Load (3) 25 VDC, Continuous
dry coil Weight—34 lbs.



AN3200-0 Leach No. 7264-759
Same as AN3201-1 except has mounted
terminals and base mounting.



AN3207-1 Leach No. 7264-571
Contacts rated 800 Amps Inductive and
Motor and 100 Amps Inductive Load
(3) 25 VDC, Continuous dry coil
Weight—1.233 lbs.



AN3207-0 Leach No. 7264-570
Same as AN3207-1 except has mounted
terminals and base mounting.



AN3207-0 Leach No. 7264-570
2517 Contacts rated 500 Amps
Inductive and Motor Load and
100 Amps Inductive (3) 25
VDC, dry coil dry coil
Weight 1.233 lbs.



AN3207-0 Leach No. 7264-570
AN3207-1 except has
mounted terminals and
base mounting.



AN3208-0 Leach
No. 7400-C 0917
Contacts rated 400
Amps Inductive and
Motor Load and 100
Amps Inductive
Load (3) 25 VDC
Continuous dry coil
Weight 2.3 lbs.



AN3209-0 Leach No.
7400-C 0918 Same as
AN3208-0 except has
insulated terminals
and base mounting.



AN3207-1 Leach No.
7401-1 0917
Contacts rated 400
Amps Inductive and
Motor and 100
Amps Inductive
Load (3) 25 VDC
Insulated dry coil
Weight 2.3 lbs.



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Planning for Production Essentials

Job of Production and Resources Division concerns equipment, manpower, materials and plant facilities.

Four basic elements in the U S war-time production program determine whether that program shall succeed or fail: production equipment, manpower, materials, and plant facilities.

Work of the Production and Resources Division of ARMC is concerned with all four of these elements: the first, essential industrial resources which finally decide the success of our national ability to outpace industry, and of our ability to outpace both the nation and the enemy.

The Division's job is to plan for production resources to support Air Force mobilization programs, as well as to provide production resources to support current Air Force production programs.

The Division is now specifically concerned with:

- Industrial mobilization planning studies
- Material requirements for aircraft programs
- Distribution of materials and component parts for aircraft programs
- Controlled Materials Plan administration in its relation to the Air Force
- Industrial facilities expansion for aircraft programs
- Providing manufacturing methods studies to aircraft production
- Purchase and distribution of industrial equipment
- Industrial equipment policy development for the Air Force

The basic plan of the military establishment is in proportion for mobilization for total war. This mobilization plan sets up the magnitude, character and timing of the military effort for victory.

From this overall plan come the technical mobilization plans. These plans determine industrial facilities of the war plan, and estimate national production and resources for Air Force purposes. It is in this area of industrial planning that the Air Material Command and specifically the Production and Resources Division has been active since 1947.

It is the Division's responsibility to take the requirements of the mobilization planning and to interpret them into what can be called industrial and to specify facilities and resources for their production. The Division works closely with industry in determining what production expansion can be obtained. It is through the workers of this work that the Joint Chiefs of Staff are kept informed of the industrial feasibility of the overall war plan.

► World War II—The development of industrial resources to support the World War II aircraft production program was slow and groping. Because of the short size of the job, trial and error and expeditious ability were invaluable. Workable procedures and organization for handling complex problems of resources control, however, were evolved by the Aircraft Production Board, the Aircraft Resources Control Office, the Aircraft Scheduling Unit, and the Resources Control Section of the Material Command.

Concerning its other accomplishments at the time of dissolution in 1947, the Chairman of the War Production Board said the "ARMC ARU organization, in the central direction of the aircraft production program, has been one of the finest and most successful examples of coordinated federal activity developed in this war." The Aircraft Scheduling Unit was located at Wright Field, and was administered by Col. E. W. Rawlings, now a lieutenant general, and commanding General of the Air Material Command. Other members were Capt. J. M. Wolke of the Navy and Col. W. S. Cove, the French representative.

The magnitude of the present defense mobilization program has again created problems similar to those in the past war. There are problems of facilitating aircraft production schedules and production bottlenecks. Competing aircraft materials and component requirements still is difficult, and the Controlled Materials Plan, production equipment and machine tools, facilities expansion, and manpower present still other problems.

There is one main purpose which threads its way through all this planning, and that is the time factor. Everything the Division does, as a planning or operational unit, is aimed at saving time if the aircraft should lose.

Mobilization planning and resource support is based upon extensive studies and analysis of World War II performance and problems. The Division has tried to develop procedures necessary to reduce these time factors. It has pushed these concepts through to the highest policy levels. The "know-how" and experience of a mobilization period is usually lost between just to three generations. The World War II experience is being utilized and is being passed on to the next generation.

The present production expansion or semi-mobilization is being carried out

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Controlled Materials

The function of the CMP Branch is to assist the controlled materials for the armament program, including allocation, audit and record keeping functions.

Materials support for armament production programs is achieved mainly through operation of the Controlled Materials Plan.

During the war these systems were employed to distribute scarce materials; the Production System (early 1948 to mid 1952), the Production Resource Control Plan (mid 1942 to mid 1943), and the Controlled Materials Plan (mid 1945 through VJ Day).

During the period of metal mobilization planning and programming (July to December, 1950) defense plans were devised and initiated and production goals established. To insure an adequate supply of materials to defense producers, a material priority system was introduced. By April, 1951, the impact of defense requirements was beginning to impinge heavily on critical materials and a Controlled Materials Plan was announced to become effective July 1, 1951.

The Controlled Materials Plan is designed to assure the fulfillment of production schedules in defense industries using the three basic metals, steel, copper and aluminum.

The essential principles of CMP are simple. The heart of the plan is the concept of requirements coordination and allotments distribution, both of which are done by so-called "classmate agencies."

The National Production Authority selects certain government offices concerned with the production of war products and essential civilian goods and designates them as classmate agencies. For the military departments, the Materiel Board performs the functions of the classmate agency.

The classmate agencies determine the controlled materials required by their contractors and manufacturers to meet production schedules. This is the demand side of the picture.

Office of Defense Mobilization determines the total quantity of steel, copper, and aluminum that can be produced and available for delivery in a given quarter of the year. This is the supply side of the picture.

Demand is matched against known supplies and necessary adjustments are made to maintain balance not only between military and civilian production but also between military programs. Each classmate agency is then allotted its materials.

Vertical Allocation—The classmate agencies then allocate the materials to

Story continued on page 194.

Chart on page 193

Why the Assault Transport?

From the ancient days of hand to hand combat to today's furious tempo of modern warfare, certain problems have remained in common. It has always been essential to get the fighting strength to the front with speed, mobility and safety. That is why the assault transport was developed—that is why the assault transport is destined to play so important a part in military operations.

This revolutionary new aircraft, whose mission is to operate to and from front lines transporting vitally needed men and equipment, has been developed through the closest cooperation between the Air Force, Army and the Chase Aircraft Company. These versatile airplanes can deliver great quantities of material to forward combat areas. They can land in short unimproved fields, be unloaded in minutes; be reloaded in an equally short time and sent on their way. There is no "ditching" back with assault transports! Compare this performance with the uncertainties of other means of delivery. Ask any fighting man who has had to "sweat out" the arrival of vitally needed equipment and supplies where and when he needed them and who then had to unpack and reassemble it before employment. The assault transport and its mission are symbols of military strategy and engineering ability.

Chase Aircraft Company, pioneer in this development, is the only manufacturer producing Assault Transports.



CHASE AIRCRAFT CO., INC.
WEST BRANTON, NEW JERSEY

nothing
is
more important
than human life!

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Think of it this way: You've just parachuted from a plane, or your damaged plane has been forced down in an unfriendly area. Your life and the lives of your fellow men are in dire peril. Survival seems remote.

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Miracles like this airborne delivery of a critically needed Helioast . . . or of armaments, food and medical supplies, "no time and no target" . . . are now common practice. The "Helioast" has been made possible by the combined skills of the Armed Forces' engineers and Pioneer Parachute Company's vast manufacturing facilities.

The Pioneer Parachute Company is justly proud of the part that great Pioneer-built cargo chutes play in these life-saving deliveries that only plane-and-chute make possible!

* Manufactured by the Edo Corporation



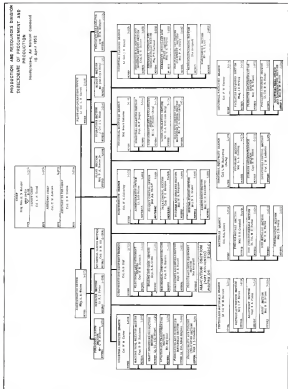
PIONEER PARACHUTE COMPANY, INC.
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the world's greatest parachute
manufacturing facilities

MENTAL and MECHANICAL!

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What's inside?

Inside these two buildings is a complete subcontracting shop—specializing in stainless steel fabrication. What's it got? Special Engineering Staff—Equipment for spot, seam, heliarc and oxyacetylene welding—Dens, rigs and fixtures for a great variety of parts—Microscopic and mechanical inspection equipment—these are the fundamentals! Add the experience of our operating technicians and you get some idea of the facilities that have earned us an industry-wide reputation as a truly unique and reliable subcontractor.

Lavelle

AIRCRAFT CORPORATION - NEWTOWN, BUCKS COUNTY, PA.

Continued From Page 190

their "prime contractors", the final assembly points of major components or end products. Prime contractors in turn extend their allotments to their "secondary contractors", who in turn allot until the controlled materials allotments have been filled down through the production chain. This plan is known as the Vertical Allotment System.

Production schedules based upon capacity factor of tools, manpower and space can be accomplished only if supported by a balanced and timely planned flow of materials and components to manufacturers and contractors.

It is assumed steel, copper, and aluminum represent a "variable driven factor" in production. In buying all programs within "productibility" with respect to these metals, requirements for other materials will be within available supply. There is controversy on this point, however.

This, then, is the essence of the plan. The administrative machinery, details and orders are much more complicated. The Production and Resources De-

To meet schedules, aircraft components must reach 100,000 by the end of the year. It is now over 100,000.

vision of AMC operates CMF as it applies to specialized military-type items (so-called A class products) assigned for procurement.

During the period May 1 through December 31, 1951, AMC received 6,044 requests for materials allotments of which 1,113 were referred to contractors for completion. Material allotments were completed on the balance.

An audit program has been set up and as it develops, more concrete requirements data will be available, and a greater degree of adequacy and accuracy of audit information will be provided. This information should reflect contact for inventories in requests for allotments that were completed on the balance.

The operation of CMF is becoming more informal as a result of contractors and operating personnel becoming more familiar with the procedures, regulations and objectives of the plan. This will result in better scheduling of materials orders, more efficient utilization of allotments and an increased ability of contractors to meet deliveries.

Manpower Branch

This branch develops Air Force industrial manpower policy, evaluates manpower utilization and impact of work programs on Air Force programs.

With adequate machine tool capacity, manpower becomes the most limiting factor in aircraft production.

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It tells about the new Johns-Manville Thermalflex Blanket with its lightweight 8.7-100 Pelt—the improved blanket type insulation for jet engine exhaust systems and aircraft and power plant assemblies.



It shows you facts about J.M. Ashcraft's Technics designed for manufacturing and fireproofing various structural and heat component parts, including system threads, and fuel, lubrication and hydraulic lines.



It describes the many special types of Corbin Metalite Gaskets—such as these aluminum gasket gaskets—developed by Johns-Manville to meet any size or shape to meet the largest making requirements of jet engines.



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is illustrated by the following figures. During the war, for example, the rate of engineering to factory work was 1 to 1, whereas today it is 1 to 6.

■ **Manpower Availability**—In the plain realm of new contracts, and the planning for new production centers, the Air Materiel Command gives serious consideration to manpower availability. This induces the necessity for supervisors which is accompanied by problems of housing, schools, health, transportation and other community facilities and services. Air Force contractors have been asked for housing these matters in the structure of the armed forces regional councils, defense manpower mobiliza-

tion committees, public housing authorities, and community manpower committees.

Other activities of AMC in this general area consist of presenting the Air Force position before the Wage Stabilization Board on "new and unusual wage cases", where such action is necessary for contractors to secure and retain essential workers, and before state labor agencies in serious working cases of violation of state labor laws with respect to hours of work and employment of women and minors.

■ **Work Stoppages**—AMC tries to the utmost of contact with both labor and management in the case of strikes at Air

Force contractors' plants and reports on their status and effects. It does not have authority to settle strikes.

From July, 1954, through September, 1954, 401 work stoppages occurred, resulting in the loss of 6,594,283 man-days of production. If you add to this figure production that was lost in plants set on strike because of failure to receive material from state-based facilities the effect on production was great.

Production losses would have been greatly had not AMC removed finished materials from these plants. Severity lists of critical shortages during and during, for example, were announced from the Alena plant at Cleveland during their recent strike, and distributed to practically every major airplane and engine plant in the country. In some cases, AMC has arranged for the reason to work to complete some critical material while the strike was in progress.

To the extent possible AMC is expending its activities in the fields of industrial relations, manpower requirements and availability, and labor utilization in a manner of expediting production and increasing the production potential of the aircraft industry. Some activities, however, are beyond the scope of the AMC organization and require action at higher levels.

Services Branch

This branch provides industry with manufacturing methods advice and analysis in productivity studies. Manufacturing methods research, productivity research and product design are considered an important phase of AMC planning.

Extensive analysis of the World War II manufacturing production program have shown that serious delays were caused by:

- Air Force products were not designed for line-assembly, high-volume production.

- The most effective and efficient manufacturing methods were not utilized throughout the manufacturing industry.

To minimize the possibility of such delays in any future mobilization program, extensive work has been undertaken in this field. In addition to the present time savings, there is saving on product and costs in the current production.

New or revised production methods are encouraged wherever practicable by coordinated action with industry representatives and engineers. Where government financing is required and where it is desirable, contracts are authorized by the Air Force to explore or implement new techniques of production.

Approximately 125 contracts have been initiated. Examples are the designing of machines specifically for Air



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Largest manufacturer of the Pacific Coast producing aircraft quality solenoids annually.



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HELPS**



BY SPEEDING STEPS BETWEEN BAR STOCK AND BLADE

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As primary suppliers of forged turbine and compressor blades to the aircraft industry, Utica is going at top speed. But that alone is not good enough — not for this race.

So we at Utica examine our methods, study them, modify them, improve them. We seek always to speed, shorten and eliminate steps between bar stock and blade.

The job must be done today, for today is soon tomorrow. Tomorrow's method will not wait until the day after — not at Utica.



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Here is an engineering and production skill you can use to help you achieve safer flight, extra fight. For 25 years, OSTER has specialized in electro-mechanical products. A staff of trained field engineers is at your service. Call us in to help you select the product best suited to your job.

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|-------------------------------|----------------------------|
| 1 Servomotor | 7 Variable Resistor |
| 2 Synchro Control Transformer | 8 Two-Speed Synchro |
| 3 Servomotor | 9 Reference Generator |
| 4 Servomotor | 10 Lock-Inertia Servomotor |
| 5 Servomotor | 11 Servomotor |
| 6 Servomotor | 12 Tachometer Generator |

DRIVE MOTORS

- | | |
|---------------------|----------------------|
| 1 Permanent Magnet | 2 400 Cycle 3 Phase |
| 3 DC | 4 400 Cycle 3 Phase |
| 5 40 Cycle AC | 6 50 — 1000 Cycle |
| 7 400 Cycle 3 Phase | 8 Variable Frequency |

FAN AND BLOWER MOTORS

- | | |
|---------------------|----------------------|
| 1 Aviation Magnet | 2 400 Cycle 3 Phase |
| 3 DC | 4 400 Cycle 3 Phase |
| 5 40 Cycle AC | 6 50 — 1000 Cycle |
| 7 400 Cycle 3 Phase | 8 Variable Frequency |

AIRCRAFT ACTUATORS

- | | |
|---------|------------|
| 1 Relay | 2 Solenoid |
|---------|------------|

JOHN OSTER
MANUFACTURING COMPANY
AVIATION DIVISION
RACINE, WISCONSIN

From type, production, application of optical tooling, redesign of form for elimination of critical surfaces, and design of them to other high volume production techniques. One such improvement, the Corbin Wright one touch and repeat on machinability of metals, has been widely distributed at industry congress.

The USAF heavy gun program, which amounts to \$100 million or more, is the largest current project of a new production technique being evaluated. This project has received a wide-spread attention. It will result in a major saving in design lead time and cost in recent production.

Since production techniques are constantly being studied, AMIC is in an excellent position to act both as a pooling agency and as a source in production problems. Whether the benefits of proprietary rights technical assistance is available to industry or not.

Facilities Branch

This branch administers the facilities expansion program and the industrial design plant program.

An "industrial facility" is property, other than material and special tooling, for use in the performance of a contract or subcontract for supplies or services. It includes real property, including buildings, structures and improvements, vehicles, machine tools and other production equipment.

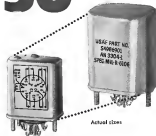
The purpose of expansion of facilities is to increase the productive capacity of Air Force contractors to meet delivery schedule of contract and physical production program.

The present industrial capacity of the country would be reduced to a greater degree and it is a different matter to do about effort. The present "bustle and gain" economy provides the utilization of a substantial part of national capacity. Even under present circumstances and possible future all-out mobilization additional special-use capacity is required for our armament production.

■ Certification of Nondestructive Inspection has been recognized, through the authorization provisions of contractors of accuracy, to recognize its capacity with its own or borrowed funds, that there are many instances where it is not good business for industry to carry on an extensive expansion because of the indefinite length of the production program. In those cases it is necessary for the Air Force to provide some facilities necessary to obtain the required productive capacity.

In the enlargement of the productive capacity of industry, additional attention for a great item has been established and expanded in line with the production policy statement of the Director of Defense Mobilization. The program

50% SMALLER LIGHTER



Actual sizes

R-B-M 22300 SERIES Hermetically Sealed Relays

The R-B-M 22300 hermetically sealed telephone type relay is the electrical and mechanical equivalent of AN 2304-1, except for smaller size and mounting dimensions.

An improved armature design, plus high temperature sealed nylon coil bobbin, provides greatly improved magnetic efficiency and enables R-B-M to reduce the overall size of the relay. The R-B-M 22300 design still retains palladium cross bar contacts identical to those used in the larger size.

Maximum contacts—6 Form A and 4 Form C—3 ampere 28 Volts. D. C. coil construction only. Maximum coil resistance 5000 ohms. Maximum power .35 watts. Also available in AN 2304 can for drymount or low capacitance application.



Optional Mounting Arrangements

Write Dept. 301 for ADD Bulletin



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—FOR AUTOMOTIVE, INDUSTRIAL, COMMUNICATION AND ELECTRONIC USE

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It is the chemical industry where
lights, essential to the safety of working areas,
burn 24 hours a day, using the savings of silastic.
In railway yards and control towers, along the docks and in
house lights all-weather, Silastic-covered lead wire can save countless
hours of labor and pay for itself in reduced maintenance and
trouble-free service. Silastic is the type of lead wire of the Dow Chemical
Company, for example, of lighting circuits are critical. In result that it does
as reported and because for more than 30,000 lighting fixtures, many of these
are repair proof or maintenance-free fixtures where heat is a more serious problem.
Over half of these fixtures burn Silastic. Most of them are used in white
weathering. Under these conditions, maintenance and replacement work is
greatly reduced. In the Railroad Department, and now quickly, lead
wires are made with Silastic. The Dow Corning silicone rubber is the only kind of
silastic insulating material that retains good dielectric properties and will not
crack or become brittle after long and continuous exposure to outdoor weathering
at temperatures from -70° to +350° F. Silastic is also used as a
gasketing and sealing material in hundreds of aircraft and automotive
applications, at temperatures ranging from -100° to more than
+300° F. It is unique among electrical insulating materials
for Class B and Class C lead wire, for igniter leads,
high control relays, and for transformers and
solid state in traction motors.

to provide these immediate demands
will be directed to provide production
lines, which will enable a greater output
than contemplated in the immediate
program, to be available as a reserve for
war. This will require a spread of contracts
across industry in widely as possible
in order to obtain a sufficiently
broad industrial base. This policy is
further explained by a Department of
Defense directive which states in part
"Industrial capacity should be large
enough to provide the rate of delivery
required not only for the current armament
build-up, but also to provide a
substantial and mobilization base as
public of the necessary expansion in the
event of full mobilization."

• **War-Time Financing**—During the
war, government financing of industrial
facilities for the aircraft program was
handled in five ways: Government-
owned facilities, emergency plant facilities,
special facilities, facilities furnished as
part of a supply contract, and the
Defense Plant Corporation. The DPC
plan of expansion was used to finance

them. Why there is such a draw on the aircraft industry for engineers, electronic
technicians and tool designers during World War II there was one engineer for
over 21 production workers, today there is one for ten.

At the same time, the cost of about 85% of all aircraft
expansion. Although many of the
facilities furnished by DPC are presently
being used, many were sold after the
war, and others are scheduled for
decommission or rehabilitation.

Two general types of contractual in-
stallations are used today to furnish
facilities: "facilities contracts" and
"facilities leases." Normally, a facilities
lease is used when the government
has a title to the facilities. Leases
must be approved by the Secretary of
the Air Force, and are used in relatively
small expansion in which the
industry and equipment have been
transferred to the contractor out of the
industrial reserve. The dollar volume of
this type is small.

Facilities contracts are usually
issued when the government does not
have facilities "in stock" to furnish a
contractor and as a necessary to expand
money to acquire facilities, build facilities,
or to repair or rehabilitate such facilities.

The following hypothetical case will
serve to illustrate AMC facility practices
and procedures.

• **AMC develops a given article** to be
produced from "X" process contract.
• **The contractor proposes a list of facilities**
required to attain the proposed
monthly production rate. This list is
called an Appendix "A."

• **AMC purchases the contractor's request**
by authorizing the scope of the
facilities contemplated, the allowability
of them, justification on a program
basis, completeness and validity of con-

tractor's written justification, and
planned dollar amount which will be re-
quired to implement and complete the
contractor's facilities expansion.

• **A pending letter to the USAF** specifies
the need for the expansion, the
and then to be produced, the peak
monthly capacity to be established, the
dollar amount of the expansion, and
the type of facilities to be furnished.
• **A government directive** then a memorandum
which establishes and allocates the
necessary funds.

• **AMC proposes a purchase request**
• **With approval of the project and purchase**
request, a facilities contract is
prepared and executed.

The manner of a contract is on a
negotiated and not a bid basis. Ordinarily,
there is no advertising or solicitation
of bids. All facilities contracts are
of cost reimbursement type, and
no profit is allowed the contractor under
the contract. He receives facilities for the
Air Force and the Air Force reimburses
him.

AMC's expansion projects numbered

from 42 on January 1, 1951, to the 415
currently in effect. During the past
year AMC proposed special facilities
contracts in the amount of \$1.5 billion
at compared with only \$50 million in
1950.

There are currently 702 facilities
leases in effect or in process whereas
in 1950 there were none of these short
term facilities.

In 1951, 447 applications for certificates
of necessity with a total value of
\$190 million were received by AMC
and forwarded to the USAF. 197 Re-
construction Finance Corporation
applications for \$26 million were received.

For the first year it is contemplated there
will be a gradual decline in the number
of new projects accepted for processing.
The work load in this area will be con-
fined to negotiation of defense contracts,
administration of contracts in effect,
and termination of some contracts
where projects will be reduced or
cancelled.

Industrial Planning

This branch is responsible for de-
veloping industrial mobilization plans,
analyzing industrial capacity studies and
administering all the details of the pro-
duction allocation and industry defense
program.

• **Allocation planning** for resources
has consisted principally of determining
the total requirements of contractors
for materials, materials, production
equipment and facilities to produce the

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world's largest manufacturers of special-
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industry—offers outstanding products
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5. Brightening heat treated
aluminum
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7. One-coat paint-bond
superoxide
8. Kerosene-cleaning
9. Metal finishing
10. Paint removing
11. Steam cleaning
12. Residue cleaning
13. Carbon cleaning
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15. Removing oil-soot stains
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19. Washing machine cleaning
20. Aluminum brightening

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MILITARY AIRCRAFT RECONDITIONING CONTRACTORS

"Battle Tested" Scott A-15

Emergency Walk-Around Breathing Equipment is
AVAILABLE



This portable, Automatic Demand Oxygen Walk-Around Equipment, standard on U.S.A.F. bombers, cargo and personnel carriers is again in production and available to military Aircraft Manufacturers.

Technical Description: U.S.A.F. Type A-1 Cylinder and Regulator Assembly consists of U.S.A.F. Type A-15 Low Pressure Demand Oxygen Regulator (Designed and produced by Scott). Automatically meters air and oxygen, supplying correct air-oxygen ratio for all altitudes up to 34,000 feet. AND U.S.A.F. Type A-6 Low Pressure Portable Oxygen Cylinder.

RECONDITIONING: SCOTT AVIATION is also equipped and approved by U.S.A.F. to process surplus A-15s for military use.

OTHER SCOTT OXYGEN FIXATING EQUIPMENT

PORTABLE (Demand) OXYGEN EQUIPMENT

1000 PSI C for crew protection on attack or target. Supplies 100% oxygen.

AVIOX: The Scott oxygen flow oxygen equipment built into a hand-carried oxygen cylinder with a hand-carried oxygen cylinder for use in four parts.



PORTABLE (Constant Flow) OXYGEN EQUIPMENT

No 3000 Supplies oxygen supply oxygen for passengers or crew.



PORTABLE, DUAL PURPOSE, OXYGEN EQUIPMENT No. 3000

Supplies 100% oxygen on demand for emergency attack or target protection. Also supplies flow in re-breather type mode for emergency or high altitude use.



FIXED SYSTEM OXYGEN EQUIPMENT No. 3000

"There's a Gals in a Control" involving a complete oxygen system including respiratory oxygen for crew and emergency demand oxygen for combat and target protection for crew. Its regulator supplies constant oxygen up to 30,000 feet. For up to 1000 sq. ft.



ECONO-MASK No. 3400

The Scott lightweight sensitive flow control re-breathing type mask. Low cost, light weight, easily donned.

OXYGEN FLOW INDICATOR

No 8340 is inserted in tubing between oxygen flow meter and mask, shows when oxygen is flowing.



modulation levels. These requirements have been kept before the appropriate planning and modulation agencies. For example, the expansion of basic steel and aluminum capacity was initiated as a result of the response of all our requirements. The expansion of the machine tool industry was preceded by vigorous efforts on the part of the branch to permit the impact of its requirements for tools.

Throughout the past several years there has existed a pattern of specific production plans for the attainment of modulation levels of production. Such plans are based upon realistic estimates of production capacities and acceleration rates.

It is within the framework and pattern of these industrial plans that the production of the aircraft industry. Flow for national allocations can be completed in an eight month period. 1,173 requests had to be corrected.

several expansions of the Air Force have taken place as it moved from a 48 group to a 70 group Air Force and from that level to a 95 wing Air Force and later to the current 141 wing structure, each plant expansion and new production source established was accomplished as planned for in the modulation programs.

In providing for plant expansion and establishment of new production sources for aircraft, the creation of additional or "reserve" capacity has been authorized in early 1951. This is known as the production acceleration program.

Under PAMP, contractors are authorized to incorporate quality of working and plant layout to create a capacity base for the ultimate modulation level.

The production program of the Air Force, whether current or projected, all are tied together and provide a pattern for expanding production to modulation levels. The production sources through which the push are achieved must be created and known to industry in advance of the time it must be put to work.

Along with plans for the aircraft manufacturers, the same type of planning has been completed for the production of equipment and parts for the aircraft. For example, the rate of build-up to peak production has been adjusted for production loss or deficiencies in such things as engines, propellers, landing gear, instrument systems, communications systems and radar. For these items the modulation production structure has been planned which also is being used in the current production program.

Today, the industry is faced with the old problem of "over capacity" schedules. One contributing factor is the defense budget which has restricted

Engine Temperatures MEASURED ACCURATELY

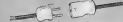
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THERMO ELECTRIC EQUIPMENT FOR MEASURING AIRCRAFT AND ENGINE TEMPERATURES

- THERMOCOUPLES FOR TURBO-ENGINE, ROTATING ENGINES
- PARALLELING HARNESSES FOR TURBO-ENGINE, ROTATING ENGINES
- CHINA COUPLING PLUG AND JACK CONNECTORS
- THERMOCOUPLE CONNECTION PANELS
- THERMOCOUPLE AND EXTENSION WIRES TO "AN" AND "MIL-M" SPECIFICATIONS
- FIVE MALL DISCONNECTS
- THERMOCOUPLE LEAD WHISTONS



Consult us on any aircraft temperature measuring problem, or write for complete Catalog C.

Thermo Electric Co., Inc.

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considerable in the last twelve months. Various shortages such as equipment, material, and tools and inadequate facilities have delayed the production of aircraft as planned and as a result, the production schedules have had to be accelerated.

Equipment Branch

This branch administers the purchase and distribution of Air Force owned machine tools, computer machine tool requirements and also administers the production of side and regular special tooling for aircraft production.

The key to aircraft productivity and the new resource which is paramount to effective industrial equality is new class tools.

In view of these complaints, and the fact that the most rapid way to build them, they represent the most vital of limiting factor in production progress, current and planned.

Air Force has the limited production capability of the machine tool industry, one of the major areas of deficiency has been the difficulty in determining the total load to be placed on the industry. During the war the industry expanded production of tools from a total annual volume of about \$200 million to a peak of \$4.5 billion. At present the annual production rate is about \$600 million. About 75% of the output goes to the military services, with the Air Force getting about 50% of the total output.

It is estimated that Air Force contractors have on order an undelivered 30,000 tools, of which two-thirds will be delivered in 1952. Under present conditions and procedures it is believed that Air Force contractors will be in good condition by the third quarter of this year as far as most tools are concerned. There will be tooling, of course, on certain critical types of aircraft tools.

AF Machine Tool Reserve—After the war the Air Force was aware of the potential shortage of machine tools in case of another emergency. Recognition of the problem resulted in the establishment of the Air Force machine tool reserve of more than 25,000 tools. The reserve was built up from government owned facilities and design was maintained at the former Martin Company, Wichita place and at Bell-Murphy, Georgia plant.

Nearly percent of this reserve has been returned to production with shipyards going to Air Force contractors, the Army, Navy and Air Force installations.

Efforts are being made to place the remaining 15% in production by continuing to make production from the reserve, by substitution of reserve machine tools for new tools as order.

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*** AF Purchase of Machine Tools**—In January, 1951, the Air Force initiated a program for the purchase of metal-working machinery to supplement the reserve and to support production. Types of tools purchased were based on specifications received from Air Force contractors and were directly related to their needs. Total purchases amounting to \$44 million and involving 1,838 tools have been made with 52 producers, most of which have been allocated to 133 Air Force contractors.

Improving Machine Tool Deliveries—Present efforts to improve delivery and reduce the status of machine tools for the Force programs are based on the Department of Defense master agreement, but the list is made by DPA, NPA, and the Department of Defense for the purpose of expediting materials, machine tools, maintenance equipment and other related equipment. The military agency system is a procedure for identifying requirements with unique category symbols which express the precedence of categories of military procurement among each other. This military agency system thus provides guidance to the production effort for the entire defense program.

The procedures of this program are fairly simple.

- Air Force contractors list the machine tools undelivered and required by them and their subcontractors to meet approved production schedules.

- Requirements are assessed in accordance with policies against:
 - the production equipment control inventory group's combined inventory of reserve tools

- If equipment is not found in the inventory, action is taken to divert the delivery of new tools in accordance with program operations established in the master inventory list.

The program has been in operation only a short time, but it has proven to be the most effective means to date in helping to solve the machine tool problem.

Materials Branch

This branch expedites materials for aircraft programs, relieves critical short ages and operates the material conservation program.

The Materials Branch differs from the Controlled Materials Plan Branch in that the Materials Branch has as its chief function the expediting of material, while the CMP Branch is primarily concerned with the allocation and audit of materials.

Another phase of industrial planning for "materials" is a conservation program. The objective of this program is to promote engineering redesign of engines and other equipment to reflect the need for critical materials such as

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Technical Service Data Sheet

Subject: PROTECTING ALUMINUM WITH ALODINE

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MIL-C-1541 SI 5 Naval O-8 675
 MIL S 5000 AN-C 170 (See MIL C 1541)
 AN B-30 U.S.A. 10-51 (See AN-B-30)
 3084 (SHIPS)

"ALODINE" HAS UNLIMITED APPLICATIONS

Flare can be caused by numerous, by stopping in an industrial welding market, by low output, or by broaching. This means that Alodine can be used anywhere, on any size or profile made of aluminum. This has led to widespread use of the Alodine process. 1. In fabrication of aluminum projects in all industries to ensure the success in product protection and finish durability. 2. by manufacturers of aluminum who are supplying Alodine aluminum there and make from the side.

In general, small size products or parts are produced rapidly and continuously in automated equipment, which can be mechanized at production volume prices. For large production of formed parts, or for Aluminized coated stock, e.g., or cut-to-size sheets, a live-ratio power spray washer is most convenient. Aircraft, trucks, trailers, housing, railway cars, bridges and other large units are Aluminized in a specific batch or on a flow-ratio machine.



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YOUR OWN ALUMINUM PROTECTION PROGRAM.



aluminum, cobalt, chromium and nickel. The national availability of these critical materials used in high temperature steel is severely limited and dependent largely on foreign sources. Accordingly their use must be reduced wherever possible.

Progress has been made in the field of conservation and substitution through extensive contacts for technical developments with various Air Force contractors, and it is now possible to reengineer in Air Force contracts specific limitations of critical materials in various categories which can be used in aeronautical equipment.

It was recognized during World War II that conservation must be a national

program with overall coordinated policy. This has again been recognized in setting up conservation activities at the NPA, DPA and the Materials Board level. Conservation orders are approved and issued under this national program.

The Materials Branch in 1951:

- Reduced 4,532 critical shortage reports. Rebut was issued for 1,563.
- Encouraged substitution for aluminum bearing alloys.
- Instituted a scrap recovery program for super alloys, materials used in jet engines.
- Organized a program for status of platinum strip to spark plug manufacturers.

Equipment Branch

The primary function of this branch is to solve critical shortages and to distribute aircraft components and equipment which are in short supply.

- Activities in 1951 included:
- Reduced 1,189 critical shortages in parts. Of this number, shortages in 1,442 cases were rebuted.
- Instituted 52 special projects. Projects incorporated preliminary studies of requirements for components against existing capacity.

Among items studied were: Aircraft engine rings, pumps, actuators, oxygen regulators, hydraulic motors, communication lamps, piezo electric quartz crystals, VN switches, electronic tubes, AN plugs and connectors, vented metal products for bearings and gears, bearings, high pressure braided hose and aircraft spark plugs.

In cases where capacity was insufficient this branch located new sources, re-evaluated requirements, investigated foreign procurement, arranged subcontracting, and set up license-license agreements.

• Completed study of gear tolerances which resulted in establishing standard gear classification for gear industry government use.

Property Records Must Be Kept

A contractor who has acquired government property or material for the fulfillment of a contract must keep certain records to satisfy the government. These records include:

- **Property Control System.** This should provide the following information: contract number, acquisition or description of the item, quantity received, quantity used, balance on hand, pasting reference, date received or issued, unit price, location and disposition when taken.
- **Consolidated Stock Record.** Where a contractor has more than one contract under which government property is provided, a consolidated record for unit price may be authorized.
- **Records of Special Tooling.**
- **Records of Plant Equipment.** Plant equipment must be accounted for by individual stock. However, in the case of accessory or auxiliary equipment which is attached to or is otherwise a part of plant equipment, and is required for the proper operation of the plant equipment, its description is attached to that of the plant equipment, and is not kept separately.

• **Records of Real Property.**

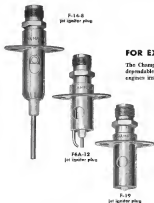
• **Scrap.** All scrap of salvage potential must be recorded. These records must be in accordance with the contractor's estimate of scrap or salvage cost.

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The familiar Champion RC368 and R1378-1 on the right are the standard spark plugs by which others are measured in the industry.

However, even though these two types meet the vast majority of current aircraft spark plug requirements, they are far from representative of the full line of Champion plugs for aircraft engines—both reciprocating and jet.



FOR EXAMPLE:

The Champion F-14-B was the first jet igniter plug permitting dependable high altitude starting of the General Electric J-47 engines installed in the F-36 and F-37 bombers.

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Westinghouse
J34
Jet Engine



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Chance Vought F4U "Corsair"



Douglas F3D "Sky Knight"

Air Force's Watchdog of Quality

The "how" of inspection is left up to the contractor; results are what Quality Control is interested in.

General Electric's air engine production line at its West Lynn, Mass., plant is spotlighted for attention these days. Both the Air Force and the engine maker who supply it are watching what goes on at West Lynn with more than a passing interest.

Last week, one of many four engines rolling off the line was torn down for inspection.

Next week, another one of every 10 will be marked for teardown. On the other hand, one of two may be chosen. Last April, every engine got the post-mortem disassembly and examination.

To the casual observer this might seem like a waste of arbitrary sampling expenditures.

► **A Pattern—It is not.** It is a series of carefully planned patterns for statistical quality control, devised by the Air Force to protect itself against hidden defects which could cause engine failure.

The plan hatched by the Air Force's attempt to approach through quality control the production which it would have with 10,000 handovers of records as given.

As a measure of guide, the government is in a unique position. Through the years it has been the backbone that all have brought with the public's delirium to be expected. It is one of the reasons for inspection process has been a regular, early business.

In World War II the Army Air Corps was bound with the picture of 100% inspection. It had some 10,000 inspection stations in the plants of its suppliers, in addition to the large staffs stationed in its depots. Despite this hoards of inspectors, the air process could hardly be said to have been with it. The whole inspection process had collapsed.

► **Basic Idea—Even in the terms of that dramatic program, the Procurement Division was experimenting with the concept of "survivable" inspection. There it defined what a trend in plenty of customer. Nevertheless, the customer had passed a loose idea.**

It was this basic idea that the manufacturer has lived with his product from its inception to its finished state, he ought to know more about the product's quality than anybody else. Couldn't he knowledge be tapped to help in the acceptance decision?

When the Department of the Air Force was established in 1947, Procurement found its big opportunity to study the inspection problem. At that time, procurement activity was at its low.

The budget was in the low price, two-line, budget.

► **Explanation—To Brig. Gen. Walter G. Rasmussen, chief of Air Material Command's Quality Control Division, explains.**

"All approaches led to the inevitable conclusion that some form of acceptance was the only means by which the Air Force could do its job within the limited personnel budgets and at the same time provide a second line for emergency expansion."

"One of the first steps was the organization of inspection from the procurement function and the establishment of the Inspection Division of Headquarters, AFMPC, in 1948. At that time, the division was redesignated the Quality Control Division, in view of the fact that the function of this organization transcended the field of acceptance inspection."

The new name did not imply that the Air Force intended to control quality in the usual sense. Rather, it was aimed at the use of "survivable" inspection would be sufficient to ensure the contractor properly controlled his own quality."

► **Final Review—As a guide to policy development, the Standard Research Institute in 1949 made a review of the inspection function of the Air Force during World War II, and offered recommendations for improvement.**

Later, the National Industrial Conference sponsored the World War II inspection problem in the Armed Services as a study. They were:

Industry had complained of the dependence of inspection among the service and the dependence of the construction effort. They said that many inspectors, particularly civilians, had been assigned for their jobs.

They deplored the red tape. Many design specifications, they said, were either too rigid or too ambiguous. Many design requirements were important or unimportant, deviating from accepted commercial practices. There was "too much 100% inspection," they declared, not enough pre-checking and use of statistical quality control methods.

► **Yet Contributions—The Armed Services had some just contributions of their own. Some contractors didn't seem to know what their contract meant, they complained. There was a lot of contracting, too. Some firms didn't have an inspection system worthy of the name. And, too, especially among the little fellows, had modern management**



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put down the needed figures and added them up carefully. In this stage, theoretically, he believes you.

► **Verification**—The second step is the verification of the customer. In this stage, the Air Force is asking questions. Again it's much like the Revenue Collector who's about to leave the boom. He wants to find out from his own independent sources whether what you said was true.

Usually, it is necessary for the Air Force to verify only a small part of the quality evidence it receives.

Avoid from getting the cooperation of industry, this two-step procedure gives the Air Force another advantage which can be estimated easily in dollars.

It can do its inspection job with a comparatively small staff.

If now takes less than 4,000 people as the Quality Control payroll is concerned.

One tangible benefit to the taxpayer from quality control is that out the Air Force's staff by 12,000.

the last inspection requirement that required 16,000 a decade ago.

► **Supplier's Advantage**—On the supplier's side the advantage is that the good contractor is going to have a maximum of surveillance. The fellow who needs them will have plenty.

The third party who gains is the taxpayer. In the past he has had to foot the bill for the enormous cost of 100% inspection—a cost which had to be written into the price of every single item.

To provide a working basis for its new policy, the Air Force in December, 1950 issued Specification MIL-Q-9923. This was amended in September, 1951 by MIL-Q-9923A.

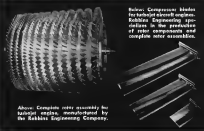
In simple language (without radical departure from government word) the Specification sets up the Air Force's minimum requirement for the contractor for an acceptable quality control or inspection system.

► **Flexibility**—The Specification is flexible enough. Quality Control people say, to apply to the biggest defense institution of Air Force production.

It does not apply to off-the-shelf purchases from distributors, purchases of hand-sawed lumber or commercial-type items, facilities routinely contracts for engineering and research studies, purchases of tools, lubricants and chemicals from reference, terminals or warehouses, or to procurement from foreign sources where reciprocal inspection agreements exist.

The specification states that the contractor must show a national or a written memorandum giving the steps of his quality control or inspection system. The manual should have a chart showing the links between the inspection system, the final office and the cost of

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Below: Compressor blades for turbojet aircraft engines. Robbins Engineering specializes in the production of rotor components and complete rotor assemblies.

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also occurs to the government: the right of "source inspection," a right usually unexercised in the past. Source inspection means Air Force inspection at a substantial level of threat and by the proper contractor.

For instance, a contractor might have a sophisticated electrical device in its product. It's built in from a subcontractor. But he has no means of giving the device the inspection he feels it should have. He can ask the Air Force for inspection at the source.

Although the contractor actually may have asked for the inspection, technically the device is considered to have been made by the Air Force.

Frequently the contractor feels he has shed the responsibility for the quality of the item by doing this.

But the Air Force isn't so sure, however. For the Air Force considers source inspection an entirely far-own benefit. Quality Control officials emphasize.

It never releases the contractor of his responsibility to furnish a completely acceptable product. It does not guarantee acceptance of the source-inspected material.

Generally, source inspection is limited to items which come not readily to the attention of the contractor because they might add extra major disassembly or special joggling.

The Air Force doesn't see anything dramatic about MIL-Q-98238. Nor does it view the directive as a coincidence. General Ban's view is like to think of it as an expression of the Air Force's drive to find a common ground with the supplier, to place more reliance on his ability while holding a satisfactory surveillance check on his work.

Processing—MIL-Q-98238 is what the Air Force calls an uncoordinated MIL specification. It has not been adopted by the other military services. So far, the Army and Navy are letting the Air Force do a single-handed pioneering job of joggling the manufacturers' information with its own to coordinate total inspection costs.

However, one phase of Quality Control program which is being closely watched by the other armed services is the inspection procedure in General Electric's West Long engine plant.

This first test ship left August when Quality Control submitted to AMC Procurement "a statistical sampling plan applicable to aircraft engines, reciprocating and turboprop." It became Defense Office Inspection 745.

In effect, DOI 745 tells the manufacturer: If you will agree to this sampling plan the Air Force will give you a flexible inspection schedule. Keep on making good engines and prove it, and you will get reduced sampling. Make bad ones and you'll be caught up with tight inspection.

► "Class F" Defects—The DOI is built around what it labels "Class F" defects. These are the hidden, serious defects which may cause engine failure, and which can be found only by a complete engine teardown. There are three other classes of defects listed in the DOI, but these can be discovered without engine teardown.

To guard against "Class F" defects the Air Force recently had to give every engine its teardown after the "green run," its initial test.

Under DOI 745 the extent of this check depends on the manufacturer's rated performance.

First he qualifies for the plan.

So he builds 125 engines. The Air Force checks the first "x" of those with teardown. If more than two engines show "Class F" defects, the manufacturer must start over with another batch of 75. If there are no more than two defective, he goes to the second qualifying step.

Here he must build 50 engines which show no "Class F" defects on teardown. If a defective engine shows up, he has to make another perfect 50.

► Flight Level—Now he's ready for the first level of inspection. He tears down and inspects one of every two engines until 75 have been torn down.

If he finds more than one defective

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ELCOR

engine in the action, he goes back to the quidding stage. He has to tear down 50 engines in a row, all acceptable, and then remove thousands of faulty other ones.

But if he has only one or an engine showing a "Class I" defect, he's ready for the second inspection level. Here he gives one out of each two engines the final inspection, until he has inspected 75. If, at those 75, he finds no bad ones, or only one, he proceeds to the third level. If he spots two defective, he goes right back to the first level—one out of two until 75 inspectors have been made, no covering up more than one defective. **Longest interval**—the third inspection level is as far as the Air Force goes, but it can stretch the sampling interval. In this stage, the manufacturer tears down one of every 100 as given would be his expected 75. He holds this level until he has an accepted ratio, then two defectives in

Quality Control methods make every engine get engine test runs—and even up to 1,700 gal. of fuel.

an single series of 75. At that point he reverts to the second level, one of four. Through every level, the Air Force tries to find the manufacturer takes steps to correct each defect as it shows up. Then the plan as it proceeds would mean to take the "bug" out of the manufacturer's engine.

When DKA 75's was launched last year, the engine makers looked at it skeptically. They had suggestions of their own. Their most frequent query, according to Air Force officials, was, "Why don't we start off sampling at one to 10 level and then work back to some thing tougher if we make defective? We've good luck."

Repeat Treatment—The Air Force isn't in a bind as a new standard gets well along. No matter how good or bad yet are, you get equal treatment before the law. That goes for postwar, too. So every supplier must submit to the same standards for the launch of new models.

The Air Force, which wanted out the plan, but had only a single application of it to date. That's in the West Lucas plant, where General Electric was ready for its final final sampling procedure. This application is only, in the nature of a service test.

But at AMEC headquarters at Wright Patterson Air Force base, it's believed that when General Electric gets going with its final final operation, other Air Force engine suppliers will get on the bandwagon.

Cost of Sampling—The AMEC officials (Start continued on p. 228, chart on p. 227)

CESNA CASE HISTORIES



G.E. PACE, PRESIDENT OF PIPELINE CONSTRUCTION & DRILLING CO., INC. "Securing a number of branch offices is difficult enough, but when they constantly move around—well, you can imagine my problem!" by "branch offices" Pace means constant drilling jobs—out of 100 permits, only 2 are permanent. He solved the quality travel problem with a Cessna 170, and says, "We get out there without any trouble."

The plane is also used for transporting personnel and repair parts, performing pipeline and aerial photography. The firm recently bought 2 more Cessna 170's. "We've never had a repair bill on any Cessna line like this speed and efficient construction, and our pilots are comfortable even on long trips to Wyoming!"



ED H. SIMON, EDITOR, EARS. "Cessna 170 is Editor's choice! As a CPA, he does thousands of flyovers every year to check out before the Census. 'Now,' he says, 'I fly to check on Wyoming in 450 hours, to Kansas City in 110 hours and to Newburg, Pa. in 10 hours 12 days by car! Our 170 is ideal for any traveling!'" Mr. Simon, the Pilot, says, "Just from a length of time, Cessna is invaluable. Efficient, easy to fly. No flies in the face, and 'Money Now' meetings. Their 170 is also used on scientific and business trips. The 'Summer' problem Cessna's visibility, roominess and economy, say, 'We fly it for only 750 an hour, plus fuel!'"

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STRUCTURE OF PROCUREMENT AND PRODUCTION
Headquarters, Air Material Command
C. JULY 1952

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(Continued from page 122)
point out that manufacturers object to the cost of the sampling system due to the change in inspection levels. Their answer is: "Would you fellows prefer 100% teardown inspection?"

The difference in the taxpayer between 100% engine teardown and the one-to-10 sampling ratio is something to consider.

On the one-to-10 ratio since engines won't have to duplicate their gross run. That saves quite a bit of fuel.

On comparative fuel/rev engines, this saving alone comes into some respectable figures. Quality Control has estimated fuel savings ranging from 15 to 510 gallons per engine shipped, depending on horsepower.

On turbojet—most of the shipping down fuel—the saving comes to between 600 and 1,700 gallons per engine, varying with the model.

► **Machine Savings**—In the matter of machine avoid per engine shipped, there's an estimated cut of between 10 and 200 hours on piston types, again depending on models. And between 55 and 125 hours on turbos.

Now add to these savings the elimination of the cost of gaskets, plugs, seals, wires and other things which have to be replaced with every engine teardown.

At this time the Air Force desires to make an estimate of savings, as applied across the board among the engine builders. Quality Control would rather wait until some solid figures can be turned up.

The engine teardown program is not one of many instances where AMEC's Quality Control division is looking into the field of Air Force procurement for ways to handle the obstacles of budget and time and dollars in the path of AMEC's located services.

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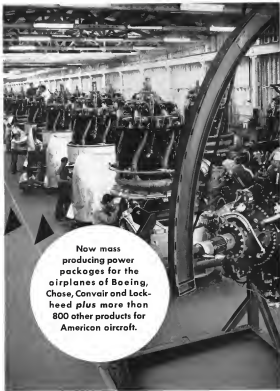
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Procurement:

Defense Secretary Robert Lovett recently said:

"The weapons have given us complex as to make it almost impossible to describe the modern fighter plane or an airplane. The modern fighter is no more like the World War II fighter... than a modern submarine is like a buggy."

As airplanes have become more complex, so has the business of their procurement through the Air Material Command. Every aircraft manufacturer says he has learned this the hard way.

The complexities don't stem from the point where the AMC Procurement Division's buyers sit down to do business with the manufacturers. They are already there.

They begin many months before the day when the contract is negotiated. They begin on the day when Air Force strategists translate their strategic program into Air Force requirements for airplanes.

At the beginning of the fiscal year, July 1, Hq. USAF notifies AMC of its program requirements in effect, Washington says.

"We'll need to equip bombers, so many fighters, so many cargo planes. Their performance must be this and so."

►Crystal Ball—This is the talent for Procurement's Operation Crystal Ball.

Procurement's first job is to reduce the Air Force's program requirements to schedule requirements. To set up a schedule of bombers, fighters and cargo craft by individual airplane type, model and price.

Then, to work out the requirements for Government-owned aircraft equipment (CPAE), the spares and supporting equipment each airplane must have. To peg these needs, Procurement must know the Air Training Command's requirements and how much the Directorate of Supply and Services will need for initial stock.

From these stages, aircraft schedules are developed.

Meanwhile, the aircraft and CPAE budgets for the program are figured and a combined program budget is developed. Then there's the matter of getting the facilities, the plants and machinery, which will be needed to build the needed airplanes and CPAE. This facilities program is rounded out well include an estimate of the man-power, materials, tools and test article requirements will need.

When aircraft schedules finally are prepared they will include schedules not only for the Air Force, but for the Army, Navy and MIDAP as well.

►Keeping it Complex—The thousands

Strictly 'Crystal Ball' planning turns out right.

of details of keeping together the aircraft and related equipment requirements for the Air Force alone make a complex planning stage.

But the last that AF buys custom aircraft for these other defense agencies are multiple planning estimates by N.

In America there are two channels of aircraft procurement for Department of Defense requirements, the Air Force and the Navy. The Navy pulls some of its planes and some equipment from the Air Force. The Air Force, in turn, draws from the Navy. Both supply the Army and MIDAP.

In addition to this, some planes supplied to the Army have Signal Corps or Ordnance equipment.

So, between the Armed Services there is a webwork of Military Interdepartmental Purchase Requests (MIPRs) for airplanes and equipment, which would make even a trained observer ask who makes what for whom and on whose budget.

The planning period generally is pegged at 12 months, ending with the end of the fiscal year in which it is launched.

►The Cycle—It is the first period in the five-year procurement cycle. It is followed by a procurement period, followed by a procurement period, followed by a year of delivery.

On this schedule, the program or requirements which were received last month by AMC at the beginning of the fiscal year, will be worked into aircraft and CPAE schedules made for approval in June, 1957.

Procurement of the items required for the program would occupy the fiscal year months of next year.

Production would begin with the year 1956, involving the tooling up for aircraft and CPAE production.

By midyear of 1955, the first completed airplanes and completed equipment would be rolling off assembly lines.

So airplanes which will be scheduled by Procurement this year may be making news a little over two years hence. Right now, those airplanes are pretty reliable things.

They're little more than a strategist's idea of the kind of weapon he wants, and approximately how many.

►Talk-Work—in a sort of half-world between strategy and logistics, Procurement Division's Planning Control Office now is working up the aircraft requirements schedule. Said a Planning Control official:

"When Hq. USAF, given its program requirements, it's something like

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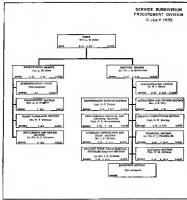
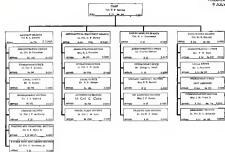
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AIRCRAFT SUBDIVISION
PRODUCTION DIVISION
7 JULY 1955



define going to a pretty state. He says:

"I want to buy something to use and I'd like to have it by mid-afternoon. Should be, but not sure that's what I want, but certainly there will have to be some more."

"Maybe it's not as bad as that, but the Air Force makes to do a lot of capital going to determine exactly what it has to have."

What comes out of planning is not necessarily going to be what USAF Headquarters has specified. Certain compromises and modifications have to be made as the schedules are made.

► Modification—Say for instance, the Air Force has asked for a certain fire-control system as one of its phases. Personnel may find that the specified fire-control system cannot be used on that particular type of aircraft. That brings up a requirement for a modification of the fire-control system.

The biggest hitch in the whole planning picture seems to be this basic fact: You simply cannot buy space and supporting equipment for an airplane until you know just what replace you are going to buy.

So that, Planning has to determine the type, the model and the size of the cost. And approximately how many it's possible to buy under the program.

From that, Planning can set up the



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schedules for spares and equipment covering the period of a year.

Now, the worst of it is that the on-line package, the airplane, its equipment and its spares must be ready simultaneously.

On the day when the aircraft is delivered to AMEC's "customer," one of the Air Force major commands, AMEC's Supply and Services division, should be ready with even spares and over-view of supporting equipment for that plane. ▶Blue Crystal Going-So it takes some briefing and some more careful planning in the planning stage to pull the GFAE package together. Just enough to time out with the aircraft schedule.

If there are no planning catastrophes, the combined aircraft and GFAE schedules have been worked out by the user end. A combined budget program has been initiated, allowing a cushion, of course. The facilities, such as plants, machine, manpower and other facilities for the maintenance unit, must have been scheduled.

Then the aircraft program is ready for approval and the planning stage is over.

But there's always the chance, at any stage of planning that strategy will change, or some contingency will arise which calls for drastic revision of the schedule all across the board. So planning will have to do some economic control going.

When planning's program has been approved, and purchase requests have been written and coordinated with all interested activities, the procurement letter is sent. In this case.

At that point the planning people can take some comfort.

They have no monopolies on complications and grief.

(Additional Procurement Division Charts on P. 240)

Armed Services Contract Appeals

Contractors may appeal from denials of contract offers or disputed contracts. Such questions are handled by the Armed Services Board of Contract Appeals. The board also considers appeals of contractor protest to contract provisions under the Contract Settlement Act of 1944.

The board is a part board of the Air Force, Army and Navy. It is divided into three panels, one of them the Air Force Contract Appeals Panel. Members of the Air Force Panel are appointed by the Assistant Secretary of the Air Force.

Each service panel generally considers appeals involving its own procure-



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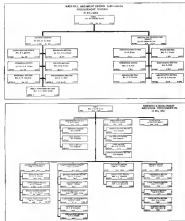
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units, but this assignment may be made if the workload of any panel becomes particularly heavy.

How to Appeal—Notice of appeal must be in writing, and the original, with two copies, may be filed with the contracting officer from whose decision the appeal is taken. Notice of appeal must be mailed or otherwise filed within the time specified in the contract or allowed by applicable directives.

The hearing will usually be held at the office of the appeals board, although the board will consider a request for a hearing at another location if compelling reasons are presented and it appears a field hearing is warranted.

It is not necessary for the applicant to appear at the hearing, or be represented there. He may submit a brief stating his case, instead.

Contracts which should be included in the notice of appeal and in the trial brief, and the complete procedure to be followed by the contractor in an appeal is described in Armed Services Procurement Regulation, Appendix A (Armed Services Board of Contract Appeals—Charter and Rules), published July 15, 1950.

Insurance Required On Govt. Contracts

The government requires that various types of insurance be carried by the contractor in deals with:

Fixed-Price Contracts. Insurance shall be that required by law. But the Air Force may require additional insurance to protect the government with respect to responsibilities imposed on the contractor in connection with the government property used or furnished by the performance of the contract. In special cases, added insurance may be deemed necessary.

Cost-plus-incentive Contracts. The same provisions apply as for fixed-price contracts. In addition, when the contractor is legally immune from liability or has an acceptable program of self-insurance, he will need workmen's compensation and employer's liability insurance, general liability insurance, automobile liability insurance on all vehicles and all the contractor's practices in connection with performance of the contract, aircraft liability insurance, where applicable.

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District Manages the Contract

Air Procurement District pays the bills and handles inspection; it also gives legal assist to contractors.

The prime mission of an Air Procurement District is to administer the Air Force contracts that are operative within its area.

The district office, mostly the one located in the legal phase of its contract and is responsible for the development of contract documents and the accomplishment of contract inspection and acceptance.

When the contract demands, the district makes whatever technical assistance may be needed.

The Air Materiel Command has established its district offices in the United States at Boston, New York, Chicago, Detroit, St. Louis and Los Angeles.

District offices are staff headquarters with a list of responsibilities flowing straight into AMC's Divisions of Procurement and Production.

Like most components of the Air Materiel Command, civilian personnel are authorized by the statute.

Regional Office—Responsible to district commander and assigned to regional responsibilities who head up the regional offices located in strategic industrial areas throughout the U.S. Air Force plant representatives stationed at critical industrial plants where vital industrial activities are performed. The Air Force contract is also under the jurisdiction of the district.

The regional representatives, in turn, have authority over regional offices, plant allies with an Air Force office-in-charge—who can be civilian or military—and those other plants which no other military has been assigned and inspection over inspection is carried by the Air Force quality control representative.

Staff functions performed by district personnel have, in most instances, been assigned counterparts in the regional offices.

Like any well organized military establishment, the district has a variety of functions to give internal support and service to its contract—personal and administrative, policy advice, inspection group, for example.

Industry Contact—It is its three districts which enter most deeply into those details that bring the district into direct contact with American industry.

These districts are Procurement Administration, Production, and Quality Control.

Actual administration of the district's contracts is accomplished by contracting

offices assigned to regional and air force plant representative offices, who call upon the district's directorate of procurement administration for guidance and advice. The districts are, within limits defined by AMC, the policies under which regional and air force plant representative contracting offices work.

Districts of Procurement Administration also maintain surveillance over activities of the district's bonded contractors and—again in an indirect act—also in AMC—accepts price as determinations of contracts.

Districts have government owned industrial property scattered in various facilities throughout their area. The control of this property and its allocation to contractors is another function of procurement administration.

When districts negotiate, prepare, and administer all contracts on local purchase items.

Production and Planning—That portion of the district mission relating to production and industrial planning is handled by the Director of Production. Production personnel work daily and closely with Air Force contractors to effect completion of contracts, paying their contractors whose production is slowing toward a scheduled date, seeking such assistance as may be necessary to keep the contract up to schedule.

Production's resources section provides aid to contractors in the control and conservation of material and keeps an eye on to detect any discordant labor-management troubles that might slow delivery of critical items.

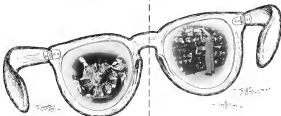
Operating out of the headquarters of the Office of Small Business which the Air Force has established in all district and regional offices to assist small business new bidding for Air Force contracts and contract new state contracts.

The development of industrial relocation plans and the determination of contract expense requirements are also handled under authority of the districts.

Perhaps the widest and most frequent association that contractors have with the Air Force is made through the Air Force quality control personnel.

Acting under policies instituted by AMC, the district directorate of quality control is responsible for planning and conducting all training needs for its inspectors. At the same time, it is responsible for establishing the exchange of inspection services with other military components.

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AF RELATIONS WITH INDUSTRY ON PUBLIC INFORMATION MATTERS



They Cope With Intangibles

USAF industrial relations officials try to smooth out the wrinkles in morale and public information.

The Air Materiel Command, chief AF purchasing agency, is spending more than \$16 billion a year in the U. S. moves toward its goal of fast-track procurement. Its job of building a modern air force while supporting space warfare in the skies over Korea is made more difficult by the complexity of present-day aircraft production.

This complexity is not only material; it is psychological, too.

► **A Job to Be Done**—USAF planners are becoming more liberal from big industry to get the broadest production techniques, efficiency and economy. A prime example of this new approach is the establishment of an "Industrial Relations" program instituted recently by USAF and Air Materiel Command.

The planes, guns, electronic equipment and thousands of other necessary items do not "materialize" simply because someone writes an order. In addition to finding the facilities, the material and manpower to do the job, there must be understanding, willing men, cooperative and a host of other intangible factors incorporated in the production machine to lubricate its gears.

For example, industry, itself, must be told on the "why" of the aircraft program. Industry's employees must understand the critical nature of their jobs. And, the American taxpayer must

be willing to support the program.

► **Industrial Relations**—Then, Air Force Regulation 70-11, entitled "Industrial Relations With Air Force Contractors," was born. Contained in it is a set of rules to guide industry in handling information and public relations aspects of the mass-production job. This new directive standardizes the policies and procedures for:

- Security review and release of classified information.
- Unclassified plant visits.
- Product identification.
- Naming aircraft and regions.
- Advertising.
- Social events.
- Photographs.
- Subcontractors and suppliers.
- Licensee-licensor relations.

It was reviewed and favorably received by public relations people of the Aircraft Industries Assn. during a recent visit in Los Angeles last fall.

► **License Office**—Because of its status in the direct production and purchasing network of the USAF, Air Materiel Command was given the job by Headquarters to put the new program into effect. A new Industrial Liaison organization with headquarters at Air Materiel Command and offices in its Air Procurement District across the nation was established.

Prime purpose of the new AMC Industrial Liaison activity is to provide a direct link between the Air Force and

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new areas, small business groups, con-
tractors, both large and small, civic and
governmental groups constantly dealing
with the AF, and its thousands of con-
tractors.

At Headquarters level at AMC, the
Industrial Liaison activity has been set
up within the Directorate of Production
and Procurement. Public Relations
phases of the program are coordinated
directly with the AMC Public Information
Office, which serves all directives and
departments within the command in a
consultative and advisory capacity.

- **Liaison Program**—Specifically, the
AMC Industrial Liaison. Operation,
both at Headquarters and in the field,
is built around an eight-point program.
- **Handles relations** with contractors,
providing data on the latest regulations,
security review, and policy guidance in
contracts and procurement information.
- **Supervises industrial relations policies.**
- **In the distribution source** for advance
data affecting the procurement program
at Headquarters and in the field.

- **Maintains close liaison** with the In-
dustrial Liaison officers at Air Proce-
dure Districts and Air Procurement
Regional Offices, and AF plant repre-
sentatives, together with higher head-
quarters such as USAF and Department
of Defense.

- **Audits AF contractors**, on request,
with special events such as plant visits
and other functions designed to stimu-
late AF production and procurement.

- **Supervises regional office Industrial
Liaison activities.**

- **Serves as staff counsel** to AF plant
representatives on matters concerning
industry and the community.

- **Is the focal point** for handling com-
munity relations where the AF proce-
dure district has no concerned.

- **Review & Clearance**—One of the
most important jobs accomplished by
the Industrial Liaison organization, and
one received heavily from the aircraft
industry, is the standardization of
security review and policy clearance
procedures.

Department of Defense policy is to
allow contractors all possible latitude in
advertising or publishing their prod-
ucts. It is desired to encourage and
assist contractors in every way possible
in this.

- Only two restrictive factors enter
into this problem.
- It is essential that no classified in-
formation be disclosed to the national
security be publicly released.

- Neither the Department of Defense
nor any of its component services, in
government agencies, nor industry, in
private industry, is permitted to imple-
ment of one manufacturer's product in preference
to similar products of other manufac-
turers.

Clearance procedures and channels

Industrial Liaison Personnel

- **Department of Defense**
Lt. Col. Robert C. Cook
Security Review Branch
Office of Public Information
Department of Defense
Washington 25, D. C.
Phone
Library 56700, Ext. 71135
- **USAF**
Lt. Col. Donald B. Perry
Industrial Liaison Officer
Directorate of Industrial Re-
sources
Office of Deputy Chief of Staff,
Material
Room 4C327, Pentagon Bldg.
Washington 25, D. C.
Phone
Library 56700, Ext. 76551
- **Air Materiel Command**
Maj. James D. Webb
Mr. Lee Felt
Industrial Liaison Office
Headquarters, AMC
Wright-Patterson AFB, Ohio
Phone
Kearney 7111, Ext. 20216
- **Central Air Procurement District**
Mr. Murray Yarn
Central AFD
W. Warren Ave. & Longo Bldg.
Detroit 32, Mich.
Phone Yarn 46610
- **Eastern Air Procurement District**
Mr. David Cook
Eastern AFD
615 Madison Ave.
New York 21, N. Y.
Phone Tuxford 69900
- **Mid-Central Air Procurement Dis-
trict**
Mr. C. G. R. Jones
Mid-Central AFD
Industrial Liaison Office
351 N. Canal St.
Chicago 6, Ill.
Phone State 21545, Ext. 40
- **Northwestern Air Procurement Dis-
trict**
Mr. John Brennan, Jr.
Northwestern AFD
14 Canal Square
Boston 5, Mass.
Phone Liberty 20200
- **Southern Air Procurement District**
Mr. Robert Wynn
Southern AFD
508 West 30th
P. O. Box 9030
Fort Worth 7, Tex.
Phone Komet 5921
- **Western Air Procurement District**
Lt. Col. Richard Hathorn
Western AFD
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are set forth in Air Regulation 70-28, Subchapter B, Bureau of Air Force Construction and Public Information Branch, General No. 10, Release to Manufacturers.

In general, manufacturers are required to submit all documents, particularly material as technical papers dealing with classified subject, contracts for review by the Security Review Branch, Office of Public Information, Department of Defense, Washington 25, D.C. Certain purely local news material can be cleared at district or regional level. All national releases, however, particularly initial releases concerning new aircraft or major components, must be cleared by the Department of Defense prior to release.

Moreover, all material involving projects of major than are classified or secret, or contain strategic considerations applicable to a national security is a release, must be cleared through the Department of Defense.

► **Objective, Susceptibility.** Main objective of clearance procedures and standards is to keep them as simple as possible. In some instances, if the agency qualified to take defensive action, with a minimum of administrative stoppage. The contractor himself can use a certain degree of common sense in interpreting clearance directives to suit time and red tape. If a paper contains detailed and technical information concerning a project of which Air National Command or Air Research and Development Command has prior cognate, basic can usually be used by sending the original direct to the General concerned, with information copy to Department of Defense.

A paper containing a single new manufacturing method, for instance, if sent to Department of Defense would normally be referred to Air National Command for recommendation and release to Washington.

On the other hand, a national release concerning a new airplane could only be easily approved by the Department of Defense, and the manufacturer would probably not have to send the original copy direct to Washington, with information copy to the subordinate command concerned and area, field or regional office as representatives who constitute his local contacts.

Subscribers again are urged to submit documents, contracts and other material, help to keep personal approval of the state of publicity on their own projects, a vital factor in establishing successful release policies. ■ **Flight White.** There is a considerable flow of reports from news media, engineering and other organizations by visits to the plants of Air Force contractors and subcontractors.

And from certain policy aspects, Air Force is primarily concerned with

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INFORMATION ABOUT FLEXLOC ON REQUEST ADDRESS: DEPARTMENT 82, AIRCRAFT PRODUCTS DIVISION, STANDARD PRESSED STEEL CO., JENKINTOWN 3, PENNSYLVANIA

two principal questions that arise with each request for a plant visit:

- Is security involved with such a visit?
- Will production be adversely affected?

Visits of selected press media must be cleared by Headquarters, USAF, prior to publication. Approval for press local visits can be given by the Air Procurement District. However, in any case, Air Force plant representatives must be consulted prior to such a visit.

The AF contractor can file his request for approval at a unit be returned through the Air Procurement District Industrial Liaison Office through Industrial Liaison, Headquarters,

ASAC, AFM, or direct to the Industrial Liaison Office, Directorate of Industrial Resources, Office of Deputy Chief of Staff, Manpower.

Regardless of the Command level when the request is filed, the coordinator will notify the units and all offices up and down the line including the interested AF representative at the plant where the visit is to take place, will be notified.

The Industrial Liaison Office, from the Pentagon as down through AMC and Air Procurement Districts is set up to handle several queries and requests for information. Again AFM, 70-20 serves as a guide. As a rule, all local

requests should be forwarded to Air Procurement Districts, while requests of national scope should be forwarded to Headquarters, AMIC, or to USAF in Washington. By maintaining a close working relationship with Industrial Liaison Officers at Air Procurement Districts, the AF contractor will have the benefit of AF guidance on such matters.

Special Events—Another function of the Industrial Liaison Office will be one of assisting with special events and functions such as plant rallies to stimulate production. Ordinarily, Air Procurement Districts will be able to supply assistance, if requested by the AF contractor, for purely local functions. However, if an event holds national significance, assistance and guidance may be sought at Headquarters, AMIC, or USAF level.

The same holds true of requests filed for Air Force speakers, which may be necessary for plant rallies, plant dedications and other morale events.

The AF contractor indirectly will file his initial request for an Air Force speaker through the Air Procurement District Office. If it is determined that the event will hold national significance, the Air Procurement District may forward the request on to Headquarters, AMIC, where a Speaker's Bureau is maintained. For reasons of economy, speakers, other than general officers, are not normally assigned to engagements beyond a 50-mi. radius from the base station. On special occasions, AF motion picture films (unclassified) and other visual aids can be supplied.

Normally, if credits are required for events sponsored by AF contractors, assistance can be requested through Air Procurement District Offices, which in turn, will forward the request to higher headquarters. In such cases AF contractors are cautioned to make such requests far enough advance to allow time for action by the higher echelons. However, for economy reasons, transportation and housing costs must be borne by the requesting agency.

Forward Shovelley all at said and done, the Air Force believes that it has established a system for effectively handling industrial liaison matters which does not preclude the use of everyday common sense. The system is thought flexible enough to meet nearly any situation, yet firmly establishes channels for utilization by the Air Force contractors.

Moreover, every effort is being made by the Air Force to fill industrial liaison job vacancies with officers and civilian personnel well acquainted with industry's problems. Most important of all, the Air Force is fully aware there is always room for improvement. And it believes its Industrial Relations Program is a step in the right direction.

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(Continued from p. 255)
 notes that a law on such legal tech might be contained in his contract. Probably the individual buyer in such a status never would be caught-trapped like that again—but that doesn't put out the other buyers, who might get caught.

Legal efficiency, in these applications adds up, therefore, to protecting the government on any "fine print" articles that may have been added to the bid by the attorneys for the awardee. With both the JAG coordination and FCR in hand—and approved—the buyer then prepares a contract memorandum of material and a letter of transmittal to the company. This action is taken on contracts that are in excess of \$10,000.

► **Contract Needs**—The memorandum, letter to you and copies of the contract then go to the contracting officer in the buyer's unit for review, approval, signing and making the letter of transmittal and copies of the contract in your own possession for retention. He also signs the memorandum and sends it to the set vice chief.

If the contract is more than \$10,000 and less than \$100,000, the set vice chief approves the award by signing the memorandum. If the award is more than \$100,000 but less than \$250,000, the memorandum must be signed by the branch chief. Awards over \$250,000 require only the signature of the set vice chief, but get reviewed by the Procurement Committee. In all three cases, the file is forwarded to the Solicitor in order that an objective review of the award may be made.

After review by Solicitor, these awards in excess of \$250,000 are forwarded to the Procurement Committee.

The entire contract file is subjected to an *exhaustive* study by the Procurement Committee to see that all pertinent papers are included and that each item in evidence is returned to proper form.

The Procurement Committee also reviews the entire contract file from the user price standpoint, and if necessary makes an inquiry about the factors involved in the determination of the unit price.

When your company's signed copies of the contract are received by the buyer, as well as the file from the Solicitor or Procurement Committee, he will prepare a disposition form if the award is less than \$10,000, and in case of a contract to the memorandum (if more than \$10,000) before forwarding the file to the contracting office.

► **In the Mail**—The contracting office will sign the required number of copies of the contract and the disposition form as an acknowledgment on the memorandum in case of a disposition.



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 CLEVELAND 6, OHIO, 1225 Main Street, Parma 44134
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 KANSAS CITY 2, MISSOURI, 4210 Main St., Kansas 64111
 LOS ANGELES 5, CALIFORNIA, 5310 W. Broadway St., Glendale 91207
 MEMPHIS 1, TENNESSEE, 1235 Main Street, Memphis 38104
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 MINNEAPOLIS 10, MINNESOTA, 3509 9th Avenue South, South 55405
 MONTELEONE, TEXAS, 2101 North Main Street, Houston 77002
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form, he sends the file to Contract Distribution by way of the PR Branch Control office.

If it is the recommendation, the contracting officer forwards it to the subcommittee who signs the endorsement before releasing the file to the Secretariat (if under \$250,000) or the Procurement Committee (if over \$250,000). It is given to the latter, the contract and supporting papers are reviewed and material approved by the appropriate approving authority is obtained. The file then is returned to the Secretariat.

Where fast review is vital in the Southwest, the review is accomplished and the file is forwarded to Contract Distribution. Your company's copies of the contract file will be forwarded to the designated home office.

• **The "Report Card"**—This, then, is what has been happening to the paperwork on that contract you have been expecting. It is the type of handling required by formal contracts and modification orders, not preceded by notices of award.

Everywhere that she went during a normal AMIC meeting, it had a little gadget working for you. It was the flow chart, sample of which is shown on page 236, which eventually is detached and sent to the Procurement Plans and Operations Office.

Just like Janusz's report card, the "grades" the operators at each major point Personnel at the Plant and Operations office generally are assigned—though they can get embarrassing personal when a stack of a few flow charts indicates one or more operators is cluttering up the process with a hazy-down operation.

The chart is dated at the conclusion of each step during its journey through the various departments and these dates amount to "evidence" of his handling where too great a time is consumed by the individual department.

All of the foregoing applies to processing of formal contracts and would not be provided by entries of award. There are parallel handling operations with a great many other types of paper work involved in other types of contracts. The one detailed was selected deliberately because it contains most of the war stations, also found in other types of agreements.

There are several of these but each is accompanied by the flare that which indicates undue delay at our stop.

Some of the others include:

Letter Contracts

Assuming your company has been selected to perform certain work, the buyer prepares a request to the AFD for an PCR. Without waiting for the PCR, he prepares a disposition form requesting authority to issue the letter.

contract. The form states that the authorization, if granted by the Procurement Committee, will be based on an affirmative PCR or an exception. The form is forwarded to the contracting officer for consideration and relay to the branch or section chief.

The next step is the Procurement Committee where, if approved, the form is returned directly to the buyer. If not approved, it is sent back to the branch or section chief.

• Through Channel-Awarding approval, the buyer presents a notice of contract obligation and a procurement notice report which is dispatched to his branch PR control. PR control extracts

the procurement action report and sends the notice to the Accounting Division for an allocation of funds. The executed notice then is returned to PR Central where it is marked and sent on to the buyer.

Meanwhile, the buyer will have prepared a request for proposition of letter contract. The request, the original PR, and the notice are sent to the legal assistant for drawing up the letter contract in sufficient quantity and return to the buyer. The letter then provides a JAG coordination sheet and forwards the file to the JAG contract branch through channels.

After receiving an affirmative FCR,

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and JAG combination, the letter writer a letter of transmittal to the contractor which he turns over to the contracting officer for signature and mailing. When your signed copies of the letter contract are returned, the letter prepares a disposition form for the Secretariat which will be forwarded to the contracting officer for coordination.

The letter, however, retains the original PR for use in issuing the definitive contract. After further consultation by the section chief, the file is forwarded, through PR control, to the Secretariat. The letter approves the letter contract and forwards the file to contract distribution after retaining the flow chart for filing with the Plans and Operations office.

Forms 26&98 Contracts

(Not Permitted By Notes Of Award)

Your company has been chosen and complete information has been made. The letter requests the AFD for an FCR on your plant, as in the case of other types of contracts. He then prepares the usual notice of contract obligation and procurement action report which goes to his branch PR control then the Services Branch PR control.

Services Branch PR control removes the procurement action report and forwards the remainder of the file to the Accounting Division where final obligation is certified on all copies of the notice. The file is returned to Services Branch PR control which extracts a copy of the notice and sends the file to the larger via his branch PR control unit.

► **Papers in Motion**—The letter then prepares a Request for Contract which, with the PR copy of the notice and all other pertinent papers are sent through his branch PR control to the Accounting & Orders Section of Services Branch. The latter branch completes a stamp on Form 26 Award, and sends to Form 98, Purchase Order. The contracts will not be dated. An copy will be maintained by the branch and the responsibilities will be sent to Point

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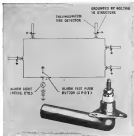
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EVER ADVANCE IN JET PLANE DESIGN demands more and more ingenious use of space on the part of aircraft designers. For this reason the installation of a high angle mount over-heat detector for Fenwal engines is a welcome contribution. Its technical prototype, at a right angle from the mounting plane has making it essential for confined spaces.



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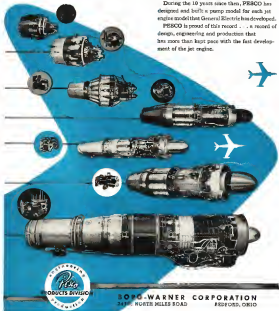
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ing for reproduction of forcible copy! After executing the contract, the buyer prepares a JAG consultation sheet and sends the file through his senior chief to the JAG contract branch for review of legal sufficiency, approval and return to the buyer. The buyer then prepares a contract memo (summary of transaction) and forwards the file to the contract officer.

If the contract is for \$100,000 or less, a distribution form will be prepared. When signed by the contracting officer, it will sign the required number of copies of the contract and either sign the distribution sheet or indicate the recommendations, as the case may be. If the award is more than \$100,000 but less than \$500,000, the contract can be approved by endorsement of the section chief.

If the contract is between \$100,000 and \$250,000, approval by the branch chief who signs the recommendation. If the award exceeds \$250,000, the section chief signs the recommendation. In all three cases, the file then is forwarded to the Secretariat.

When the award does not exceed \$250,000, the Secretariat reviews the file and award before forwarding to Contract Distribution—sending a copy of the recommendation endorsement to the buyer. On contracts over \$250,000, the Procurement Contract Review Committee of the file, obtains mutual approval of the appropriate approving authority and returns the file to the Secretariat for processing similar to those contracts under \$250,000.

Notices of Award

Terms and conditions of the contract have been agreed upon by your company and the buyer and the latter then makes the customary request for an FCR from the AFM. He then prepares a Notice of Award and a JAG consultation sheet. The notice will be included in all cases over \$100,000. If the award is more than \$250,000, it will bear a certification which reads: "This award has been approved by the DCH No. 70-3" as required by law.

The section chief, assistant section chief or procurement assistant will sign the JAG consultation sheet and forward the file to the JAG contract branch. The latter organization will review the file and, if approved, will return it to the buyer.

In the meantime, the buyer will have prepared a notice of contract obligation and a procurement action report which are processed exactly as is previously noted even through Services Branch PFI control, the Accounting Division and back through channels to the buyer. The buyer then makes up a contract memorandum of transaction and it is included in the file to be forwarded,

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under listed conditions as to dollar volume to the Secretariat and the Procurement Committee. The Secretariat will execute the distribution and submit the approved file to the same dollar limit previously listed.

Formal Contracts

(Sponsoring Notices of Award)

The buyer will draw up a request for contract preparation and forward it to the legal assistant who prepares the formal contract and sends the required number of copies to the buyer. The letter then designates the JAG coordinate run sheet and that is transmitted through channels outlined above for other types of requests.

The structure of the action on this type of contract is identical with procedures above as relating to the Secretariat and Procurement Committee.

Forms 26&98 Contracts

(Sponsoring Notices of Award)

The PR, notice of contract obligation, copy of the completed notice of award, bids or quotations and all pertinent papers in the award file will be sent to the Advertising & Order section for preparation of details on Form 26, Award, and parts on Form 98, Purchase Orders. If the award exceeds \$250,000, the cover page will have the following certification: Award of this contract was approved by _____ as required by

DOI No. 70 7.

Subsequent procedures involving the JAG contract branch, Secretariat, and Procurement Committee are the same as in other contracts.

Small Purchases Branch

(\$10,000 or less)

Assuming that your company has been chosen for the award, the buyer prepares the notice of contract obligation and procurement action report which are processed through channels as outlined above. The departure from procedures involved in other types of contracts begins when the notice is returned.

The buyer prepares a request for contract and forwards it, with the PR, quotations and all pertinent papers to the Writing and Reproduction unit. The unit writes and reproduces enough copies of the contract to fulfill distribution needs. Copies of the notice are included in the contract file when it is returned from the Accounting Division.

The contracts then are delivered to the contracting officer for review and if proper, signature. He prepares a distribution list and forwards the complete file to Contract Distribution.

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Your FCR

- Facility Capability Report is good insurance.
- Your firm must square with it to get contract.

One of the best buy-way "insurance policies"—designed to protect you and the Air Force—on a falling term of an Air Force contract is the Facility Capability Report (FCR) required in awarding contracts over \$10,000.

In simple terms, it is a report that your plant is capable of carrying the required delivery schedule at the base the contract is awarded. Like plenty of other Air Force regulations, the FCR was born of such travel.

A buyer at AMC may have very good and well that your plant is equipped to produce—in accordance with delivery schedules—in a procurement on which you have submitted the bid. What he doesn't know is how much outside work you may have scheduled in the form of prime or sub-contracts with other agencies or private industry. Assurances have been made as the plant only to find that production facilities were not up-to-speed during the interim between submitting the bid and receiving the contract.

► **The Big Question:** Therefore, with few exceptions, the buyer is required to obtain from your Air Procurement District some current facts on your status. In no case will figures more than 60 days old be accepted.

• **What you first able to meet contractual obligations?** Biggest factor is the basic use of your machine tools and equipment. Are they adequate to make this shop to be produced? Then comes your production facilities. Is your present production schedule so heavy that any new demand would force you into an impossible struggle to produce the item? What new commitments do you anticipate during the lifetime of the pending contract? Another factor is your company's proven production record on past contracts. Is the proposed delivery schedule beyond your production capacity? What about availability of contract-furnished material or components? Do you have the skilled labor necessary to fabricate production parts?

• **What is your current financial status?** Are you capable of paying your own way during the lifetime of the proposed contract, or will you need help?

• **Are you a responsible bidder?** Again, past performance and your company's code of ethics will be scrutinized.

• **What percentage of subcontracting is contemplated?**

The internal AMC mechanics of the

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FCR, are simple. The buyer asks the proper Air Procurement Division (APD) for answers to all the foregoing questions. The APD makes its check and transmits the answers to the buyer. A few days maximum time limit is specified, except when exceptional circumstances prevent and in those cases the APD must make its answer with stating the reasons for the delay.

Where the answer to any of the questions is "No," the APD is compelled to say why.

In preparing the answers to the first questions the APD has an option—where a "no" is submitted on ability to meet the delivery schedule of negotiating a delivery schedule which your company can meet.

To the second question, the APD can answer yes, or in specific first year company can perform all financial assistance under terms of that provision are applied.

Complete explanations will be made by the APD in answering the third and fourth questions.

► **Sale Source Items**—If the item involved is classed as a "sale source" item and the APD has knowledge of other firms capable of manufacturing it, that information will be sent to the buyer.

After receiving a negative reply to the first question, the buyer may ask for a reconsideration by the APD or modify the delivery schedule to suit your company's capabilities.

Unqualified negative replies to the second question will be filed "N," however, the APD has indicated that performance can be accomplished with financial assistance, he desires to meet the contract will be classed through the Financial Branch prior to execution.

Negative answers to the third question will be submitted to the Procurement Division staff for review and recommendations.

In general, the foregoing applies to formally advertised and registered procurements. Exceptions include purchases of continued technical services, purchases from the Federal Supply Schedules, technical data on items already in production, books, periodicals and magazines, off-the-shelf articles, spare military items, foreign purchases, air transport services, purchases by the Small Purchase Branch and others of a minor nature.

Sureties for Bonds

Various types of bonds may be required of a contractor doing business with the Air Force.

In lieu of corporate or individual sureties on bonds, the contractor may furnish United States Bonds, Notes, certified or cashier's checks, bank drafts, money orders or currency.

Property Classes

For procurement and stocking purposes, the Air Force divides its property into various classes and sub-classes following is the complete classification list as of April, 1952.

- 01-A—Complete aircraft
- 01-W—Complete aircraft components
- 01-Z—Complete general instructional aircraft
- Aircraft Parts
- 01-B—Controlled V shape
- 01-C—Constant Wing
- 01-D—Dowry
- 01-E—Noddy
- 01-F—Boeing
- 01-G—Hiller Helicopter
- 01-H—Pitts Helicopter
- 01-I—Cessna
- 01-J—Taco Engineering
- 01-K—Sopwith
- 01-L—Noorduyn
- 01-M—De Havilland
- 01-N—Curtis
- 01-O—Waco (Aircraft)
- 01-P—Berch
- 01-Q—Sikorsky
- 01-R—Waco (Glider)
- 01-S—Glenn L. Martin
- 01-T—Lockheed
- 01-U—North American
- 01-V—Republic
- 01-W—Pittsford
- 01-X—Cessna
- 01-Y—Bell
- 01-Z—Aircraft
- 01-U—Parts
- 01-U—Tailfin

- Aircraft Engines and Parts
- 02-A—Complete aircraft engines
- 02-B—Aircraft aircraft engines
- 02-C—Continental
- 02-D—Wright
- 02-E—Jacobs
- 02-F—Pratt & Whitney
- 02-G—Alford
- 02-H—Packard (Bell Helicopter)
- 02-I—Aircraft engine
- 02-J—General Electric
- 02-K—Westinghouse
- 02-L—Pratt & Whitney
- 02-M—Whitely, books, data, floats and parts
- 02-N—Aircraft electrical equip
- 02-O—Aircraft carburetors & parts
- 02-P—Turbo-propellers & parts
- 02-Q—Miscellaneous aircraft accessories & parts
- 02-R—Hydraulic actuators, cylinders & parts
- 02-S—Aircraft ignition systems & parts
- 02-T—Aircraft fuel, hyd., vac., oil, de-ice systems
- 02-U—Miscellaneous engine accessories & parts
- 02-V—Aircraft engine parts & parts
- 02-W—Turbopropeller system parts, rotary wing aircraft

- 03-B—Rubber materials
- 04-C—Diaper, tents & tubes
- 04-D—Aircraft bearings & parts
- 05-A—Aircraft rest seats & parts
- 05-G—Aircraft flight suits & parts
- 05-D—Aircraft engine parts & parts
- 05-E—Aircraft & training aids instruments, standard parts
- 05-F—Aircraft pilot, gyro control & parts
- 05-G—Miscellaneous aircraft instruments & parts
- 05-H—Training aids instruments & parts
- 05-I—Electrical cables & parts
- 05-A—Aircraft engine fuel & oil
- 06-B—Laboratory, components, parts

- cylinders
- 07—Diaper, tents & cleaning equipment
- 08-A—Commercial electrical equip & parts
- 08-B—Commercial electrical supplies
- 08-C—Electrical terminals & terminal boards
- 08-D—Flying field night lighting equip & parts
- 08-E—Electrical connections & parts
- 08-F—Electrical wire and cable
- 08-G—Lamps and bases
- 08-H—Motorizing, power source and lamps
- 08-B—Circuit breakers & parts
- 09-C—Glasses



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- 11-A-Bombing equip., accessories & parts
- 11-B-Gunnery equip., accessories & parts
- 11-D-Locally controlled aircraft turn-on & parts
- 11-E-Aircraft controlled aircraft gas way fire system & parts
- 12-1-Ref. & oil handling equip.
- 13-A-Special purpose clothing
- 13-B-Victory emblem, male
- 13-C-Female emblem
- 13-D-Indicator, male
- 13-E-Military emblem, female
- 13-F-Indicator, female
- 13-H-Indicator, female
- 13-I-Indicator, female
- 13-J-Indicator, female
- 13-K-Indicator, female
- 13-L-Indicator, female
- 13-M-Indicator, female
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- 13-Q-Indicator, female
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- 13-U-Indicator, female
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- 29I—Cable & chains
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- 30H—Dictionaries
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- 33C—Electing, venting, plumbing, drain equip. & parts
- 33D—Autom. take-off equip.
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- 33L—Armament
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- 33AT—Bulldozing equip. & parts
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- 33AV—Grading equip. & supplies
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- 33AX—New tool & boring equip. & parts
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- 33AZ—Pumps & wood
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Constant motion seat development work in TICO includes rigid strength and load testing programs for every seat design on a common basic hydraulic test rig. Insensitive interpretation of test data eliminates structural changes, when necessary, to gradually provide every TICO seat customer with the most safe, rugged, light weight and maintenance free seat ever available. ... another reason leading airlines agree—the data either test on TICO or not!



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FIBERGLAS*
PANELS**

Type III Backing Board can now be used to replace heavier board thereby effecting substantial savings in weight.

Standard size is 48" x 96" but sizes up to 48" x 108" are available on special order. Types I and II Backing Board are also carried in stock.

Fiberglass cloth and net in any thickness up to 1/8" furnished for cargo and passenger cable line.

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being recorded in January, 1951.
Figures for the first six months of 1951, released by Capt. Parke H. Temple, CRD chief, reveal an average of 142 a day.
The CRD plant at Wright-Patterson AFB is expected to be duplicated at Air Force sponsored depots under the decentralization program. All of the facilities currently available to the public at CRD here will be found at the depots, although physical location may be believed to fit requirements at the individual depot.
It also has been announced that personnel information, regarding as the depots, consisting of copies of BIRs and ARPs will be posted at all the depots and Air Force Command District and Regional offices.
AMC Codes
One of the most baffling features at first glance of the AMC documents are the addresses you find in telephone books, newspaper charts and literature about the numerous field activities. There is very simple logic and orderliness to an address such as "MCW" "A" "B303" "F3015" that you will find on the master AMC chart on page 83.
Flora right to left, it means Post 1015, Building 285, Room A, and the code symbol is M for Material, C for Component and F for Information. AMC's buildings are so numerous and cat into so many huge bags that it is impossible to meet cases to transfer offices in an orderly sequence. Therefore, AMC symbolizes the points in letters in the distribution shown, it is Post 315 on the second floor. All of the buildings in each of the main areas, A, B and C are numbered to make finding a particular office in great ease.
For working purposes, the code symbol is all important.
Once you get on to it, the code is simple. For AMC offices it always begins with MC (Within Air Development Center's code begins with WC). Then follows the number for the top office or division, such as C for Component's Office, P for Directorate of Procurement and Production, S for Directorate of Supply and Services. The last letter may be followed by a number, such as MC PFRAS, which means the fifth section or unit in the branch.
Following is a list of symbols for the main organizations within AMC:
Communications General: MCG
Director Commanding General: MCGD
Admin. Management Division: MCGA
General Support, Director of: MCGH
Comptroller: MCGC
Inspector General's Office: MCGI
Judge Advocate General: MCGJ
Procurement & Training, Director of: MCGP
Procurement & Production Division: MCGP

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FOR SANDWICH CONSTRUCTION

STRUX, used as a core between aluminum or fiber glass laminate, provides increased strength and stiffness with only a slight increase in weight. . . (STRUX is much lighter than balsa wood) . . . excellent on lines and fiber blocks with wing fuel tanks.

Cellular Cellulose Acetate (CCA) manufactured under duPont license, is extruded continuously in reels, beams and special shapes. . . and is positive plugs for gun, cannon and rocket head tubes in jet fighters.

STRUX can be used at temperatures up to 350° F., has high dielectric properties, excellent buoyancy in water, oil and other liquids, good mauling qualities against sand, and resistance to fungi and decay.

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MATCHED DIE MOLDING

We manufacture hundreds of different parts molded to aircraft tolerances. There are practically no limitations as to size, complexity of contour or depth or draw. Parts may be fabricated in opaque, translucent or ultraviolet drawings can be molded in so that they never need replacement.

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Construction Materials Branch: MCPAN
Construction, Liaison: MCPAN
Industrial Relations Branch: MCPAN
Inspector & Budget Branch: MCPAN
Publicity & Production Branch: MCPAN
Procurement Section: MCPAN
Production Section: MCPAN
Printing & Forms Control Section: MCPAN
Records Control Section: MCPAN
Executive Office: MCPA
Executive for Constructed Projects: MCPA
General Services Office: MCPA
Special Services Office: MCPA
Field Operations Office: MCPA
Drops: MCPA
Contract Services Branch: MCPAN
Industrial Property Accounts: MCPAN
Office of Inspection: MCPA
Office of Procurement Construction: MCPA
Plans & Program Office: MCPA
Drops: MCPA
Administration Office: MCPA
Program Room: MCPA
Budget Branch: MCPAN
Budget Preparation Section: MCPAN
Field Control Section: MCPAN
CIP Budget Data Section: MCPAN
Construction Materials Branch: MCPAN
Program Branch: MCPAN
Program Control Section: MCPAN
Program Plans Section: MCPAN
Program Status Section: MCPAN
Industrial Relations Division: MCPA
Information: MCPAN
Inspection Chief: MCPAN
Asst. to the Chief: MCPAN
Drops Chief: MCPAN
Administration Office: MCPAN
Industrial Liaison: MCPAN
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Bearing & Gear Sec: MCPAN
Component Accounts Sec: MCPAN
Electronic & Instrument Sec: MCPAN
General & Field Support Sec: MCPAN
Mechanical Component Sec: MCPAN
Control Materials Branch: MCPAN
Aluminum Sec: MCPAN
Aids Sec: MCPAN
Research & Service Sec: MCPAN
Industrial Equipment Branch: MCPAN
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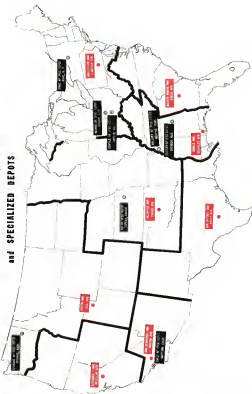
As the nation relies on the aviation industry, so do the leaders in the aviation industry rely on Rheem.

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These plants cover more than 50 acres and offer more than 400,000 square feet of production space in the aviation industry.

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Research and Development • Engineering • Production
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DECENTRALIZATION

Will Decentralized Buying Work?

- AMC says it can be done, and must be done, despite problems, for greater operating efficiency, economy.
- But contractors are not too happy about the program; they think it will mean more lost time and delays.

At the halfway point in decentralizing Air Materiel Command functions, the program still is the center of controversy in the most pointed method of purchasing Air Force materiel.

Involving an AMC top management, employees scheduled to be transferred to Air Force specialized depots, and manufacturers doing business with the Air Force.

Details of the program were announced by AMC in April. The announcement indicated that centers exist in Supply Requirements, Maintenance, and Procurement would be moved out to various AF depots and Air Materiel areas (see facing page). Former Area headquarters would serve as force, engine, propeller, and Government Furnished Equipment (GFE) as closing major electronic devices AMC stepped out the schedule of new locations (page 92) and the functions which would be moved out at the depots.

Initially, employees of units to be moved were given options on being assigned to the decentralized unit, transferring to other positions at Wright-Patterson AFB for which they were qualified, resigning, or being reassigned from government service.

►The Reason—Operational economy and efficiency were cited by AMC as being the basic motive for the program. Lower levels were lack of adequate space at Wright-Patterson AFB, fuel problems, a housing shortage in Dayton and surrounding communities, and an increasing amount of correspondence required under the old program of keeping the AMC operation under one roof.

Unstated officially, but nevertheless not a smaller scale reason for the decentralization strategy, contractors, AMC at Dayton is the heart of the Air Force, pouring together blood in the operational command. This heart is concentrated in as 100 sq. miles. It is unsuitable to both climate and direct attack.

That concentration of all Air Force materiel assets and operations has been a source of concern among top AF officers for some time. Decentralization, of course, will not be the entire answer because the centralized view of the

command will still be lodged at Wright-Patterson Air Force Base. But decentralization will relieve some of the worry of Air Force planners.

In its initial stages, decentralization will run little if any danger. AMC will have to make up with training costs eventually, perhaps put at many people in government jobs as it has now. The all-important difference is that those people will not be at AMC headquarters.

►Mail and Mail—Procurement was the move has been somewhat less than a breathing room. AMC figures reveal that a fraction less than 45% of employees holding positions in decentralized operations have accompanied their positions to specialized depots. The cost figures are \$75 having to take up their duties at new stations, \$65 being transferred to other jobs at Wright-Patterson AFB. 44 resignations and 36 separations from government service. The 1,035 personnel already moved up amounts approximately half of the 2,000 scheduled for decentralization by the end of 1953, AMC said.

Finally and/or property loss are the biggest reasons for employees declining to leave Dayton and vicinity. A large factor for central employees is a reluctance to transfer below the 36th degree. Dallas (see 92) another large factor is the feeling among employees that depots, being lower echelon installations, will have generally lower salary scales than are to be found at AMC head quarters.

►Same Work, Same Pay—In increase, Lt. Gen. E. W. Raelings, AMC commanding general, noted a strong feeling among those who will be moved downgrading among employees. Furthermore, the general stated, the chances for upgrading at the depots will be exactly the same as at Wright-Patterson AFB.

Gen. Raelings pointed out that, since the entire function is being transferred, an equivalent remains the same regardless of location. He derided downgrading—as a direct result of decentralization—as not at all the question.

►Training Program—The newly 92%

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of contracts also have added to more chaos. AMC's biggest headache is the decentralization program. If it is to be replaced, Underhill, it would take years to assimilate in the new people the know-how possessed by the old AMC. Heads who are not moving. But AMC has set up a center for inquiry and contracting officials that may be surprisingly effective.

Yesterday's training class began July 7. A new publication, "Air Force Requirements Handbook," written by an outside firm, is the textbook for the class. Not only is it all encompassing as far as procurement procedures and practices are concerned, it is written in common sense style with a wealth of down-to-earth advice in discussing regulations of contractors, for example, the Handbook says.

"If the contractor is unable to supply both government and commercial customers, at a general rule he will be unwilling to accept government business."

"If he [the contractor] thinks government work will help his competition or new customer he likely will seek government business to form a combination."

"The buyer should take advantage of terms strongly desired by the contractor in order to acquire his own business position."

"The quickest way to reach an agreement is to avoid argument with the contractor."

AMC hopes that such distillation of wisdom acquired the hard way through years of experience will enable the new buyers to start off with far more success than normally could be expected.

Any 'Red Apples'?—There is one other danger in the decentralization program, but AMC officials insist it is more potential than probable, and they offer good supporting reasons. The danger is "inequality."

Observers point out to officials directing decentralization that procurement irregularities occurred among various AMC personnel, men whose past had been impeccable enough to furnish passports for trust. Now AMC is being perhaps several hundred new buyers whose integrity has not been exposed to the temptations occasionally being AMC buyers.

Will these new men measure up to AMC standards? If they don't, won't they be harder to detect because they will be so far from headquarters? AMC officials assure "yes" to the first question, "no" to the second.

In effect, they say, people are people. Among the approximately 35,000 AMC headquarters personnel, a very small fraction of 1% proved unworthy of the trust placed in them. There is no reason the percentage of trustworthy as

contracts should be any higher further from AMC headquarters.

And if any of the new buyers do turn out to be "red apples," it will be easier—not more difficult—to detect them. One reason procurement irregularities at headquarters went undetected for so long, officials say, was because there were too many people to be policed at headquarters. A bad apple in a small group is far more apparent.

►The Outlook View—Air Force contractors, generally speaking, are not too happy with the decentralization program. That figure it will increase their administrative and liaison expenses. Perhaps the hard core of resistance behind this is that an estimated 90% of Air Force procurement dollars will continue to be obligated at Wright-Patterson AFB. That's the volume to be expended on airplanes, engines, propellers and GFE, no matter what size the current area budget.

However, an estimated 90% of AMC contracts will be processed at the depot when procurement is centered around on a schedule to begin Aug. 15. Contractors rise in the air of correspondence with AMC on contracts are apprehensive about the inevitable time delays attendant to shuffling paperwork from depot to Wright-Patterson AFB—and this is only a second or two lost for their money.

However, they feel that any repetition of procurement and engineering functions is a check to such in much but time on any contract for its item subject to extra manual engineering designs. Contract drawing is expensive equipment orders engineering and design changes practically the rule of the day on most of the Air Force copy must being supplied today.

When using contractors are quick to emphasize that with procurement and project engineers presently located in the same area at Wright-Patterson AFB—there is much lost time in shuffling paperwork between layers and project officers. Many shudder to contemplate the potential time loss when procurement is shifted several hundred miles away, instead of several blocks.

These same producers are not concerned, particularly, with the decentralization of supply and maintenance functions. The big job of supply requirements is to originate purchase requests (PR) which book down to converting of Air Force commands year to an increasing PR. This can be accomplished down any base in the continental United States, they say.

The situation currently adds up to a test of contract prediction. First is the AMC concentration that it can be done. Second is the conviction's conviction that the whole operation, so far as procurement is concerned, will be moved to Wright-Patterson AFB within a year.

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U-S-S SUPERKORE—a pioneer boron steel proves effective in conserving "critical" alloys

More than six years ago, United States Steel Company developed U-S-S SuperKore A, which is essentially a 4312, plus boron and 0.0250 boron, variation. Used by a leading aircraft engine builder, this steel designated as TB-43H1212 has successfully replaced 3316, in heavy-duty gears, shafts and pinions for large aircraft engine engines used in powered aircraft use under AMS 9500-1086. Not only does SuperKore A save one-half the nickel and two-thirds the chromium formerly required but the manufacturer reports improved carburizing characteristics—both less retained austenite and fewer undissolved carbides on direct quenching.

Recently, U-S-S SuperKore AA—a 4315 plus boron—shown improved hardness over the surface steel large forgings have been used by a leading heavy-duty truck builder who reports that transmission counter-shafts made from it have been in service for five years with excellent results. Used to replace 4850 types, this steel now designated as TB-48BV14 reduces nickel and molybdenum requirements by one-half.

Another U-S-S SuperKore Steel—

SuperKore B—which is a 4315 plus boron, designated TB-43B12, has been successfully used for more than three years to replace 4812, in making a fuselage line of rock bolt cutters, and seven one-half the nickel formerly required.

U-S-S SuperKore C—an 4315 plus boron—originally developed to replace 4850 carburizing grade steel which reduces nickel by one-half and molybdenum by one-third has shown good results.

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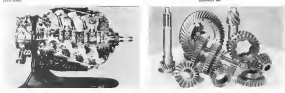
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There are other approaches to the alloy problem

Although the substitution of alloy steels for standard alloy steels has yielded many benefits, it does not solve the alloy problem. Alloy steels are still used in many critical applications. Alloy steels are still used in many critical applications. Alloy steels are still used in many critical applications. Alloy steels are still used in many critical applications.

Heavy-duty steel forgings made from our patented alloy steel and used in the manufacture of U-S-S SuperKore A.

is added to the use of U-S-S SuperKore A in this application. Alloy steels are still used in many critical applications. Alloy steels are still used in many critical applications. Alloy steels are still used in many critical applications.



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PROCUREMENT GROUND RULES

A Legal Jungle Is Home to the Buyer

A purchasing agent in industry conversely could go as far in a hunt for the Air Force. It would be through as fast as the Air Force, the Air Materiel Command, its buying agencies and AMC procedures. In industry, it is almost as dictated by common sense and strictly law, in AMC, law being as much dictated by a man of legislation, sometimes obsolete, sometimes contradictory, and by the whims of administration and politics.

And the legislation has a non-responsible goal to give the taxpayer his money's worth, and the Air Force the best money on buy—without making anyone angry.

Designing over AMC and its procurement practices is always a mighty dance. On the one hand, it is a balancing act between the carefully balanced form of AMC procedures.

In theory, Congress can legislate that AMC could buy from a small shop with a few men. It never has and probably never will. But some of the legislation which provides the ground rules for AMC buying highlights the Congressional ambivalence just in itself.

Most of the present Air Force buying authority is de-

ived from the Armed Services Procurement Act of 1947. But there are still some law provisions of the Air Corps Act of 1926, particularly in the realm of patent rights. And the 1947 act has been supplemented temporarily in part by a 1951 extension of portions of the First War Powers Act. Some portions of the Defense Production Act of 1950 also affect the 1947 purchase act.

There are perhaps a dozen miscellaneous laws covering certain regulations regarding procurement. These are the Acquisition Act of 1951. Picked from the mass of legislation in the Armed Services Procurement Regulation, a thick book of rules and interpretations that is the Bible of procurement men in all their services. From ASPR has been selected a body of provisions, amplified and interpreted into the Air Force Procurement Procedures. From the flow a stream of "Regulations," "Circulars," "Letters," "Directives" and "Instructions" have been sent to the Air Force. And every day, every day, he makes a new procurement assignment. Just what he has to consider—and what a business man wanting to do business with the Air Force should consider—is summed up in the following system:

Basic Rules: The Laws

The three ground rules for the Air Force procurement were set in 1947 with passage of two laws: Public Law 751, National Security Act, and Public Law 413, the Armed Services Procurement Act. The first created an independent Department of the Air Force with procurement to do its own purchasing.

The second had done the business acquisition in purchasing that must be followed not only by USAF but by Army, Navy, Coast Guard and National Aeronautics Administration.

National Security Act—The law which created these co-equal armed services in a Department of Defense gave the Secretary of Defense two years in which to split off the Air Force functions from the Army. The procurement authority was transferred in January, 1948 to "Transfer Code No. 6." While this code placed USAF procurement in the hands of the Secretary of the Air Force, it also provided that the authority could be redelegated.

Consequently, the Secretary of the Air Force redelegated the procurement responsibility to the Air Force Unitary Secretary who passed it along to the Deputy Chief of Staff, Materiel, who sent it on to the Commanding General of the Air Materiel Command, who turned the authority over to the Director, Procurement and Production.

Each redelegation was accomplished by an appropriate regulation, each of which is a law in the sense which now controls AMC with the procurement law.

Procurement Act—The Armed Services Procurement Act of 1947 was enacted two years after a war, development, research or experimental work involved in procurement of the item.

When national security would be affected by the public disclosure of information in advertising.

When standardization and interchangeability of parts in technical equipment is in the public interest and could not be obtained through an act of national procurement.

When substantial investment is involved in the procurement, and advertisement would result in duplication of that investment or duplication.

Negotiated Contracts—The act also deals with the contract terms in government procurement. It outlines fully cost-plus-a-percentage-of-cost contracts. But it permits cost-plus-fixed fee contracts under certain conditions (usually for research and development contracts) and limits the fee to 10% of the estimated cost of the contract exclusive of the fee or profit-plus contracts, 15% on research and development contracts.

Under cost-plus-fixed fee contracts, contractors are required to notify the procuring agency of any CFFB subcontracts, or any fixed price subcontracts in excess of \$15,000. The law

gives the procuring agency the authority to inspect the plant and audit the books and records of any company working on a CFFP prime or sub contract.

The law lays down certain specific terms applicable to negotiated contracts. One permits the procuring agency to grant advance payments to the contractor, but "only upon adequate security." In practice this generally means a lien on the contractor's inventory covered by the contract. Another requirement is that negotiated procurements is that the contract must contain a provision against contingent fees.

► **Other Laws**—The Procurement Act of 1947 was the basic law for less than three years before it had to be supplemented. When the Korean war began, some administrative matters were necessary in procurement and to the administration of government contracts. So several new laws and executive orders indicated the procurement act.

► **Public Law 922**, enacted in January, 1951 amends and extends Title I of the First War Powers Act which was the legal authority for acquisition during World War II. Under P. L. 922 the President may authorize any department or agency to enter into con-

tracts, amendments and modifications of contracts, and to make advance, progress and other payments regardless of provisions in the procurement law. However, Executive Order 10350—issued under the terms of P. L. 921—makes it clear that the 1947 procurement act is still the basic statute governing procurement.

At the present time, P. L. 921 is being used by the Air Force primarily in authority for changing the terms of contracts to correct mistakes.

► **Defense Production Act** of 1950 affects procurement principally because it establishes the authority for controlling materials and expanding production facilities.

► **Public Law 152**, enacted in 1949, established the General Services Administration to improve and control all general supply activities of the government. Although the law does not exempt the armed services from its provisions giving GSA charge over government supply activities, it does exempt the Secretary of Defense, with the approval of the President, to exempt the Defense Department from the provisions of the law.

Accordingly, the Defense Department, GSA and the Budget Bureau are now working out a delineation of responsibilities. Agreements reached to fix make the Federal Supply Service, which is part of GSA, the procuring agency for certain strictly commercial articles, such as typewriters, for the armed forces.

And there are other laws supplementing the Armed Services Procurement Act.

Special Laws: To Each His Own

An Air Force buyer or contracting officer has only begun his legal formal situation when he enters through P. L. 413 and category laws. Government purchases are affected by laws and orders on buyers and supplier, use of contract labor and child labor, foreign purchases, "excessive" profits, and to cut discrimination to name only a few.

► **Employment Conditions**—Both statutes and executive orders pertain to employment conditions. In every government contract is a clause under which the contractor agrees not to employ any person in connection with the performance of the contract who is undergoing sentence of imprisonment at hard labor.

There are exceptions. The clause does not apply to purchases from an alien or foreign person, or to employment of person on parole or probation, in those pardoned or to those who have served their terms.

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has been that contractors shall not practice discrimination in employment because of race, creed, color or national origin. Further, a prime contractor must include such a provision in his subcontracts. It is against this policy even to require employees to be American citizens.

And the policy is so firm that buyers are instructed to place the business elsewhere if a contractor refuses to accept the non-discrimination clause. The clause must be adhered to even if it means the government must pay a higher price for the supplies.

"Oxygene" child labor is prohibited by the Fair Labor Standards Act of 1938. This act applies to all employees engaged in producing goods in interstate commerce, not just to those employees engaged in producing for a governmental contract. This is the law which sets minimum wages and maximum hours. It's not as specialized as its application in other laws.

Wages and Hours—There is an entire body of laws in the wages and hours field, and the more important for buyer and contractor alike is the Walsh-Healey Public Contracts Act of 1938. Walsh-Healey. This law applies only to government contracts in excess of \$10,000 and requires inclusion in the contract of certain provisions regarding

Air Force can't make a contractor hire only American citizens, so another what the nature of his work.

contract labor, child labor, safe working conditions and other employment conditions. But its main impact on government and industry comes from its wage provisions.

Under the terms of the act, the Secretary of Labor makes a "determination" of the prevailing minimum wage for an industry. All contractors in that industry must then pay at least the minimum to all employees working on government contracts.

Proven violators of the clauses required by the Walsh-Healey Act will be declared ineligible to alien government contracts for three years.

There are some exceptions to the act, notably contracts exclusively for services, and when a contract for more than \$10,000 is referred to less than that amount, if no buyer comes under the act. On the other hand, a contract that is increased to more than \$10,000 is subject to the law.

"Reader being limited to certain classes of contracts, the act is also limited to certain contractors and employers," the Air Force tells its buyers in a recently published handbook. "The contracting officer is responsible

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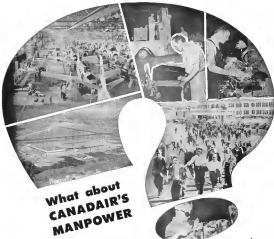
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law determining when the Walsh-Healey Act applies to a contemplated procurement.

So that path another break in Air Force buying and contracting officials. And this one is of a peculiar nature. The Armed Service Procurement Regulations, ASPR, directives, etc., all are prepared by the armed services and personally to meet a need the services themselves have found. But this ground rule set by the Walsh-Healey Act are the doing of the Secretary of Labor and not him. The ASPR handbook says "the act does not apply to subcontractors." However, the Labor Department for some time has been proposing that prime contractors be responsible for the observance of Walsh-Healey by their subcontractors.

• **Eight-Hour Law.** This law is older than the Air Force or its predecessor. It goes back to 1912, although it since has been amended several times. Basically, it provides that no laborer or workman working on a government prime or subcontract shall be permitted to work more than eight hours a day unless paid at least time and one-half when he passes the eight-hour mark. As in Walsh-Healey, there are exceptions and the Department of Labor, not the Air Force, is responsible for the terms of the law. And the eight-hour law applies even when the contract is small.

• **Davis-Bacon Act.** This law applies to laborers and mechanics on public works contracts over \$2,000 and employs some of the same provisions as the Walsh-Healey and Eight-Hour laws. It also requires that each contract stipulate that the contractor and his subcontractors must pay not less than once a week the full amount accrued to all laborers and mechanics, computed at not less than the wage rates listed in the specifications for the work. To live up to the terms of this law, a contracting officer must get from the Labor Department a wage determination, and must obtain weekly pay-roll receipts from the contractor to see that he is complying with the law.

• **Capitol Act.** While the Davis-Bacon law applies to laborers and mechanics on public works contracts over \$2,000, this act covers all employees. Its main purpose is to make illegal "kick-backs" of wages.

• **Foreign Purchases—The Buy American Act** is a good example of a law enacted for a specific purpose, that stays on the books and must be a concern of Air Force buyers even after the conditions that inspired it no longer persist. It was passed in the depression days when government contracts were almost nonexistent because then they were not being bid and Congress was anxious to see that U.S. industry got

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performance over foreign lines.

If the supplier can be seen inside the U.S., the act does not apply. Thus, as foreign owners can buy from foreign firms. Otherwise, the Air Force cannot buy foreign manufactured goods unless they were manufactured from supplies furnished from the U.S. The service contracts can make exceptions where appropriate.

- Be inconsistent with the public interest.
- Increase cost of the supplies to be bought.
- Be expeditious or unnecessary in curing the cost of construction and repair work.

Under the first exception cited above the service contracts have decided that in the period of national emergency it would be inconsistent with the public interest to apply the War Relocation Act to supplies made in Canada. Although this is a blanket exemption (as are other statutes now being sought), here on had contracting officers still had to file several special reports on Canadian purchases.

• **Limiting Profits.** There are two main laws concerned with "excessive" profits. One is the War Relocation Act, which has been in effect for many years and the other is the Resignation Act of 1951. As originally passed, the War Relocation Act required that a ceiling portion of government account had to be built each year in government facilities and the costs of these plants were to be reduced by which to increase the cost of aircraft changed to government by private builders.

As it stands today, however, the act's main feature provides that the contractor must pay to the U.S. Treasury all profits or excess of 12% of the contract price of aircraft. Repairs and contracting officers still have to keep in mind the War Relocation Act although its application is very limited. For one thing, it applies only to contracts for complete aircraft and major components. In addition, the growing use of subcontractors prevents direct application of the act.

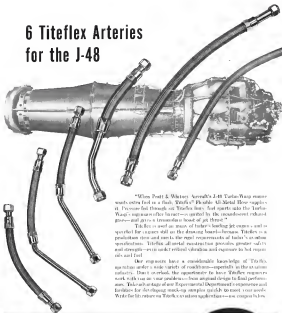
And to make the use of the War Relocation Act highly unlikely, there is the Resignation Law, (see page 338)

Interpretations: The Regulations

The Armed Services Procurement Regulations is the direct regulatory tool of the 1947 procurement law. It applies to all services, and consequently cannot be specific regarding the procurement of individual services.

In general, ASPR lays down broad policies, but does not issue more directives to all services. An ASPR (1-

6 Titeflex Arteries for the J-48



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self says in the introduction: "Rules, regulations and objectives of any department act in conflict with this regulation, as from time to time amended, shall remain in full force and effect. This regulation is not intended to cover detailed procurement procedures or instructions of the respective departments and their personnel activities."

ASPR became effective May 15, 1946. Eventually, it will comprise 15 sections and several appendices, but not all of the sections have been completed. In most not yet covered by ASPR, the Joint Procurement Regulation is the guiding policy.

ASPR is not static. It is continuously being revised. Representatives of the three services meet periodically to discuss these revisions, and recommendations are appended to handle specific problems. Representatives of the military also are called on to give suggestions.

• **Basic Policies**—An example of the basic principles ASPR lays down are the basic policy set forth in Section 1, Part 3. After stating that the two principal methods of procurement are formal advertising and negotiation, the regulation lists sources of supplies as:

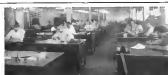
• **Government agencies with surplus stocks.** "To the extent possible, supplies shall be obtained from surplus property in the hands of disposal agencies, or from surplus or excess stocks in the hands of any government agency."

• **Supplies outside the government.** Regulations as to what supplies are to be bought by advertising or negotiation, "competitive proposals" shall be obtained from all such qualified sources as are deemed necessary by the contracting office to assure such full and free competition to obtain for the government the most advantageous contract—price, quality and other factors considered."

• **Small business concerns.** "It shall be the policy of each department to place with small business concerns (business concerns) in the purchase of supplies (over \$50,000) a fair proportion of the total procurement of supplies and services for that department."

• **When not clearly to the disadvantage of the department, the procurement of supplies and services shall be divided into such reasonably small lots as will enable and encourage small business concerns to make bids as competitors on such supplies and services.**

• **Private Institutions**—Most of ASPR is concerned with types of contracts and the preliminary to contracts. And in dealing with the preliminary to a contract involving from an advertised bid, ASPR does not set any specific. Section II, Part 2 deals with advertising, bids, and



TYPICAL BUYING SECTION in Procurement Division, where progress are made.

Meet the Air Force Buyer . . .

Every government purchase of from the complex, delicate, and delicate nature, and the complex nature of the military economy.

The Air Force buyer-agent of each Air Force procurement—this holds a primary responsibility for the success of the procurement mission and the national defense policy.

The mission of Air Force procurement is to obtain, for the Air Force, the goods and services needed for the proper quality and quantity of materials to be delivered at the right time and the right place.

• **Public Responsibility.** The buyer is responsible for all details from the initiation or receipt of the Purchase Request to the execution of the contract. He must:

- Investigate the sources of supply.
- Determine the method of procurement.
- Be fair and reasonable prices.
- Draft contracts which protect the interest of the parties.
- Give the timing of the Purchase Request, when he organizes the contract, with the need for the supplies.

• **The Authority.** The buyer is vested with the authority necessary to discharge his responsibilities.

• **He is a contracting officer, and authorized to execute contracts binding the government.**

• **He may also, deviations from specifications where warranted.**

• **He decides whether the goods will be ordered in bulk or under the latest delivery clause of a contract, when delivery material is delivered and accepted.**

• **He initiates action for contract termination both by default and non-performance of the government.**

• **He is the buyer of the concept of "best value."** The buyer is responsible for all details from the initiation or receipt of the Purchase Request to the execution of the contract. He must:

- **Intelligent Buying.** The buyer must know his product and his market. Intelligent buying depends on his knowing:
- How and where a product is made; manufacturing techniques that are employed.
- Effect of changes of design on production methods and costs.
- Market conditions and special problems of the industry.
- The conditions with which he deals. Through study of commercial publications, or records and experience of past government contracts, he becomes familiar with a supplier's qualifications.
- Contracting Officers. The author of the buyer is to meet and represent the government in the purchase of goods by means of DOD (Defense Office Instructions) 701, Appendix 1, in his capacity as a contracting officer.

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details exactly what should be contained on the invitation for bid (IFB) form.

Because of ASRA, IFB for all items are standard, and all the principal parts of an IFB are set forth in ASRA. An AMC before awarding does not have to worry about choice of an IFB form, but ASRA does permit each source to include in an IFB any provision peculiar to that source.

Methods of soliciting bids (which are used by the Air Force and described elsewhere in this issue) also are prescribed by ASRA, including a provision that responses for IFBs shall be prepared and sent to Commerce Department regional offices. Among other things ASRA states that "A study of all conditions for bids shall not be opened less than 15 days from date of issue."

Handling of bids—ASRA also requires that the purchasing officer follow certain procedures in handling bids after they are submitted. This is all detailed in Section Part 4.

Although sealed bids are directed to be kept unopened until the official time of opening, ASRA says an unsubmitted bid "may be opened solely for the purpose of determining, provided that such bid shall be opened immediately and that no information obtained therefrom shall be disclosed."

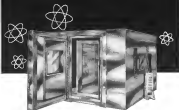
It is up to the bidder, says ASRA, to prepare his bid envelope. But it is in the responsibility of the contracting officer, after the bids are opened and put to the award, to "examine all bids for major inaccuracies or irregularities and for obvious or apparent mistakes."

When the contracting officer finds such major errors, he "shall give the bidder an opportunity to cure any deficiencies," while it is not to be the disadvantage of the government. The contracting officer himself may award any obvious clerical mistake provided he first obtains from the bidder a statement "to its own mistake shown."

Despite these instructions, ASRA gives the contracting officer wide latitude in accepting bids. "Any bid which does not conform to the essential requirements of the invitation for bid shall be rejected, provided that any such bid may be considered when in the interest of the government and not prejudicial to other bidders."

All bids may be rejected by the contracting officer when rejection is in the interest of the government or when he finds it is unfair that the bids are not reasonable or were not independently arrived at in open competition, or are collusive, or were submitted in bad faith. Any conduct of bids not independently arrived at shall be forwarded to the Justice Department.

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► Deciding Awards—Wherever ASFR discusses contracts, it inevitably makes the point that awards should be administered to the government "fair and other factors considered." Part 4 lists some of these other factors—a buyer in contracting often may consider:

- Judgment, skill and integrity of a bidder
- Experience and expertise of a bidder, and price work of a similar nature done by him
- Feasible costs or delays to the government resulting from differences in inspection, shipping, location of supplies and such details
- Changes made or requested in any of the provisions of the solicitation, to the extent that any such change does not constitute ground for rejection of the bid
- Restrictions or conditions imposed in the bid

► Advantages or disadvantages to the government resulting from the making of multiple awards.

When two or more bids are equal, the award "shall be made by drawing by lot which shall be witnessed by at least three persons and which may be attended by the bidder or their representatives." But that is not always the only procedure. When lot means equal

A contracting officer may throw out all bids on a contract, but he's got to have good reasons for the action.

bid, the buyer as contracting officer has another set of principles to guide him. He has to make the award to:

- A Small business firm if one of the equal bidders is in that category. If all are small business firms, then the drawing by lot takes place.

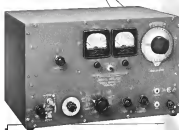
► Firms in a distressed area. If all state they will perform the work at a distressed employment area then the drawing by lot shall take place. A firm other than small business may improve the award in case of equal bids if it guarantees to do the work in a distressed area and a small business firm cannot give that guarantee.

► Use of Negotiated—Discuss it at the fastest, most flexible method of procurement: meet procurement officials' policy objectives to advertising. But most small business firms for obvious reasons prefer advertising. Finally with this bid awarded conflict in mind, the outcome of ASFR in Section III, Part 2 go into some detail in interpreting the provisions in law that permit negotiation.

First ASFR cites the authority for negotiation in the 1947 procurement act, then outlines application of that authority.

► National emergency. ASFR declares this authority shall be used "only to

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In general, the Air Force Procurement Procedures parallel and coincide with ASPP. But the purpose of AFPP is to go into procurement procedures that are distinctive to the Air Force and to spell out in greater detail the Air Force procedural side of the procedures specified by ASPP.

For example, ASPP, Section II Part 4, says "all bids . . . shall be publicly opened and read aloud in the presence of all interested parties. . . . It is to open the bids." AFPP, Section 2, Part 4 says "The officer whose duty it is to open the bids shall decide when the specified time has arrived, and then will personally and publicly open all bids received and read them aloud to those present, and a record of each bid shall then be made."

The bids of AFPP are concerned with letting the buyer or contracting officer select items to be used, with whom, and in what fashion. And many of the key procedures are outlined by repeating in simplified language the pertinent part of ASPP in order to bring AFPP.

The Results: The Contracts

The end result of the maze of two and sometimes three which a buyer must pick his way is a contract. But "a contract" is an oversimplification. There are six general types of defense contracts including letters of intent or "letter contracts."

• **Fixed Price.** This is the only type of contract used in advertised procurements. It also is used in negotiated procurements. It also always with special features that would not be incorporated in a contract following an advertised procurement. At the same time, it provides for a firm price, and nothing more.

• **Fixed-Price With Deduction.** This contract starts out with a fixed price, but has provisions for changing the price during the life of the contract. And because of reimbursement, this type of contract may take one of its different forms.

• **Cost-plus Contract.** This type of contract today is used for the largest part of Air Force procurement, dollar war, for it is particularly standard in the procurement of airplanes. Usually, it may be either a fixed price, or possibly a cost-plus fixed fee contract. It provides for a tentative contract price with a maximum price or maximum fee.

After completion of the contract, a final price or fee is determined on the basis of the contractor's actual costs plus a fixed fee or profit or fee which varies inversely with the cost. But the final fee or price cannot exceed

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Aircraft Vibration & Flutter

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The first thorough explanation of the principles of aerodynamics and the mechanical and structural vibrations and aerodynamic phenomena. The author covers the entire field of aircraft vibration and flutter, from the basic principles of vibration to the latest developments in the field. The book is written in a clear and concise style, making it accessible to both students and professionals. It is an essential reference for anyone involved in the design or operation of aircraft.



Aircraft Drafting

By H. H. Emmerich. If you are taking an air course or are a designer and need a reference book, this is the one you need. It covers all aspects of aircraft drafting, from the basic principles of drafting to the latest developments in the field. The book is written in a clear and concise style, making it accessible to both students and professionals. It is an essential reference for anyone involved in the design or operation of aircraft.

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the maximum stated in the contract.

As an example, assume the ceiling is 120% of the contract, or target price, and that the contractor's profit is 5% of the target price. If the contractor's final costs are less than the target, he retains 28% of the savings, and the government gets the other 80%.

• **Cost Contract.** Under this type of contract, the government pays the contractor's allowable costs, as specified in the contract, and adds cost or estimated cost. The fee may not vary with the actual costs, although it may be changed if the estimated costs are changed.

Reason for this is that a venture type of contract, employing percentage-of-cost, has been outlawed by Congress as a ploy to promote ineffectiveness.

Even the CPTT type of contract has limitations. It cannot be used unless it is likely to be less costly than any other type of contract, or unless it is "expected to stress supplies or services" by other types of contracts. Because of its nature, most research and development work cannot be bought by any other contract than a CPTT, although almost all research contracts with government are of this type.

And the law and ASFR limits the amount of fee for under this type of contract. While the law permits a fee of 15% of estimated cost on research and development work, and 10% on production work, ASFR specifies that fee shall be no more than 10% and 7% respectively.

• **Time and Materials.** This type of contract provides for the purchase of supplies or services on the basis of direct labor hours at specified hourly rates (which includes direct labor, overhead and profit), and of materials at cost. This type of contract would naturally be used for overhead and such work.

• **Fixed-Price Redesign.** While most of the Air Force dollars are spent through incentive contracts because they cover the most costly items, the most frequently used type of contract is a negotiated procurement call for redesign of a fixed price.

The Air Force uses five types of price determination:

- **Price 1—Upward or downward price increase negotiated at fixed periods with prospective effect only.**
- **Price 2A—Upward or downward revision negotiated upon demand of either party, with prospective effect only. The demands have to be at least 90 days apart.**
- **Price 2B—Upward or downward revision after a stated time, with the revision retroactive. After the first six**

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tion, other party can demand payment, which would affect future price only, but the demands can be no less than 90 days apart.

• **Form III**—Downward action upon demand of the contracting officer after completion or termination of the contract.

• **Form IV**—Downward or limited upward revision after completion or termination of the contract.

• **Form V**—Upward or downward action authorized upon the happening of a specific contingent event and limited to that event and its direct effect.

• **Use of Forms**—Since the start of the Korean War, Form IV has been used most extensively. Prior to that time, Forms III and IV had been widely used in research and development contracts. Forms I and Form IIA are used in contracts of verifiable extended duration which require repetitive operations and in which costs can be estimated fairly accurately because of previous experience with similar contracts.

Form III also is used in contracts of verifiable extended duration which require repetitive operations, but on which cost data is lacking until some time after completion of the work. Reintermediation on \$518 million worth of contracts since Jan. 1, 1951, has saved nearly \$25 million—4.86%.

Work has been done. The last period for reintermediation is fixed in the contract as being from 20% to 40% of advances. After that the last order revision is made.

Form V is rarely used by the Air Force.

• **Results of Reintermediation**—In testimony before the Senate subcommittee on operations, ASAC cited these results from reintermediation of prices since Jan. 1, 1951:

- **Target or contract price** \$107,988,772
- **Final negotiated price** \$491,889,560
- **Savings to the government** \$25,689,212
- **Ratio of savings to target price** 4.96%

• **Contract Termination**—Neither has the contracting officer been forced to terminate a contract when it is signed and work has begun. They have to administer the contract during its life, and the contracting officer has the authority job of handling the details when and if the contract is terminated.

A CIP's most ticklish problem is to negotiate a contract by default. Default positions in a contract specify that it can be terminated if a contractor fails to deliver or performs in a required time, fails to perform any other provisions of the contract, or if he so fails to make progress "as to endanger performance of the contract." A contractor

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is liable to default for the last annual season only if the future profits for at least 10 years, or for a longer period specified by the contracting officer.

The industry objected to the "no-design performance" provision, but it has been retained to cover the government on long looking time contracts. However, it is seldom invoked. Most defaults are because of failure to pay fees as driver on time. A contractor is not liable for default due to reasons not under his control, such as fire, floods, and strikes.

Transmogrify Inc. default makes a contractor liable for excessive costs to the government for replacement of the supplies covered by the defaulted contract. This, all claims, may result in court action. But the government has another recourse. ASPR provides that contracts wrongfully terminated for default shall be terminated for the "inconvenience of the government."

The transmission "no convenience" clause in a contract is a huge tool to cover all possible changes in government requirements. As the Air Force buyer's handbook explains, "The power Congress has given to the armed services to make contracts is considered to carry with it the inherent power to terminate such contracts when the supplies or services being purchased are no longer needed."

Clearly in this way, can the armed forces have flexibility in procurement.

Each contract contains a standard termination clause which in the first paragraph says "... this contract may be terminated by the government at any time without cause, or for cause, or for cause to terminate at any time, whenever the contracting officer shall determine that such termination is in the best interests of the government."

So that puts it squarely up to the GO. But he has a long list of principles and examples from ASPR to guide him after the termination notice has been given. Once the decision has been made to terminate, the basic objective is to make a settlement with the contractor that will compensate him for work done and for preparation he has made to continue with the work that has been terminated.

ASPR gives three examples of costs which can be included in a termination settlement:

- Advertising costs that can be "reasonably allocated" to the terminated portion of the contract.
- Bonds and insurance, including will insurance, but not premiums on insurance of the lives of officers and directors.
- Claims of subcontractors which are consequent to the contract and to other work of the contractor.
- Compensation of officers that is reasonable, in the light of services re-

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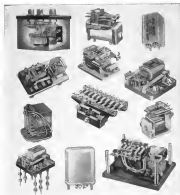
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dead, and that is allocable to the terminated portion of the contract.

• Costs that contain other elements which displace all reasonable efforts of the contractor to decrease costs upon receipt of the termination notice.

• Depreciation or "appropriate" rates.

• Special tooling, engineering and development costs, provided that the contractor transfer title to the government.

• Research expense to the extent it is consistent with an established program of the contractor and to the extent that it is reasonably related to defense purposes.

• Initial costs that have not been allocated to the completed portion of the contract because fewer articles were produced than were originally called for under the contract. Initial costs can include labor costs and high material costs which are incurred because of the learning period on a new contract.

• Miscellaneous in trade, business and professional organizations.

• Preparatory expenses, including plant alterations, organization, planning and other organizational undertakings especially for the contract.

• No Profit, No Loss—Object of termination "for convenience" is to save the government money by not completing

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supplies that will be made. But the government tries to avoid loss to the contractor. According to the Air Force handbook, termination clauses provide basis of interest financing to cover contractors who have big investments with bills coming due before settlement can be made.

Assessments up to 100% of the contract price may be paid for work done at significant times completed prior to termination date, or completed after and with the approval of the contracting officer. Up to 90% of the direct costs on termination inventory may be paid before final settlement is made. But there can be no partial payment of profit or a fixed fee.

In settlement, according to ASPR, the contractor should be allowed profit only on preparatory, made and work done for the terminated portion of the contract. No profit is allowed on goods terminated and settlement expense.

The system, long as it is, covers only parts of the buyer's contention that he must learn by heart or keep close at hand.

But he could increase all the per unit fees, and still be caught off base. For when all's said and done, Congress makes the laws—and seldom into the buyer's corner.—W. E.

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The Squeeze on Aircraft Profits

Renegotiation is supposed to take back excess profits at year-end—if AMC redetermination leaves any.

By Selig Altschul

The aircraft industry, by its very nature, is subject to close scrutiny as to its profits by the controlling government agencies.

The manner through which aircraft profits are kept on line and prevented from becoming "successes," is consistently subjected to the renegotiation. Actually, in the postwar period, renegotiation is itself less than has been its unknown element. But it is because the renegotiation processes wait at the end of the line, that the question has been applied to profit margins in the aircraft industry.

► **Fixed-Price Contracts**—Under the broad policies the Munitions Board has indicated, Air Force, Navy, and Army still have a wide leeway in the type of contract they may list. The Air Force, in fact, whenever possible, favors general contracts with price redetermination and escalation clauses.

► **Redetermination**—Under this form of arrangement the Air Force sets out a "flat sample," usually 25%, of the entire contract as completed. Then actual output costs are examined and the contract price is "redetermined" in view of the experience demonstrated.

► **Escalation** is tied to items such as the rising cost of materials or labor. An escalation clause operates almost automatically with the change in price of the items concerned. Officials, however, tend to keep the list of "costs" subject to escalation as limited as possible.

► **Redetermination to Renegotiation**—It is highly significant that funds are covered under price redetermination are available in the procuring agency for further action, but funds acquired under renegotiation go directly to the Treasury and are not available to the military services for additional procurements. Price redetermination, furthermore, develops revenue potential on plans on the part of the contracting offices in the Air Material Command at the Air Force. This "close pricing" is constantly designed a secondary leverage effort to render to each additional funds as possible for further procurement.

More important, a contracting office is frequently under the situation that if any profit should remain for renegotiation he has failed to do his job properly; therefore, profit margins are squeezed at every opportunity in the price redetermination processes.

This is demonstrated by the low profit margins prevailing as published 1954 aircraft company annual reports. The average profit margin on sales for the industry was around 2%.

This approach of, in effect, applying renegotiation to the price redetermination process was never intended. Price redetermination is to apply to individual contracts which may extend for several years. Renegotiation is based upon the overall profits of a manufacturer on all government work for a given year. The Renegotiation Act of 1949, later amended as the Renegotiation Act of 1951, applies in this respect.

► **Why Renegotiate?**—The purposes of renegotiation were defined by Frank L. Roberts, Chairman, Military Renegotiation Policy and Review Board, Office of the Secretary of Defense, before the Committee on Finance of the U. S. Senate in its considering the Renegotiation Act of 1951. Among other things Mr. Roberts declared:

"Renegotiation is a broad, overall operation. It is not a detailed process of audit and examination, contract by contract and dollar by dollar. Nor is it a device to merely re-examine costs as an equivalent in individual process some transactions. The renegotiation authorities do not meet the price of each contract after completion of performance and payment. This type of individual price adjustment, which was contemplated in the earliest days of renegotiation and from which the process derived its name, grew very almost immediately, out of obvious necessity, to overall review of a contractor's operations for his entire fiscal year.

"This basic overview is indispensable to any understanding of what renegotiation is and the way it works. All of a contractor's receipts or accruals during the year from all of his contracts and subcontracts subject to renegotiation, including both his profitable and his non-profitable ones, and all of his costs and expenses applicable thereto are considered at a single time in a single period, together with all pertinent facts and figures, and a single overall determination is made.

* Sources before Committee on Finance, U. S. Senate 1954 Congress. First Session, on S. 1174, p. 2.



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"It is entirely a judgment on either side. There is no fixed formula or yardstick for the determination of excessive profits, nor is there any fixed criterion to the amount of profits which may be realized or retained by any contractor."

"If to excessive profits occurred to exist, a clearance is granted to the contractor. If it is determined that excessive profits were realized, a determination of the amount thereof is made and this determination is embodied in an agreement or order."

"As you gentlemen know, this procedure has several advantages."

"The consideration of all contracts and subcontracts as a group reduces cost accounting and allocation of cost to a minimum and saves time for both contractors and the Government."

"The use of the fiscal period for negotiation facilitates the use of the regular financial and accounting method administered by contractors for his purposes and avoids the preparation of soft data or an entirely different basis. In addition, this method allows contractors to adjust their losses on one or more contracts subject to negotiation against their profits from other subject contracts during the same period." (Hicks supplies.)

This statement presumably was made to satisfy the contractor's concern with the procedure of determining excessive profits. Strong support was accorded the recognition of efficiency. It is also clear that considerable latitude is present in the determination of excessive profits.

The "ground rule" specified for negotiation was undoubtedly given a "forward look" by the contracting officers in the price underestimation program. For this reason the philosophy currently underlying the administration of the Renegotiation Act seems almost apparent.

► **Board Policy**—Empowering independent states, the Renegotiation Board has the responsibility of administering the Renegotiation Act of 1951. Board policy declarations have emerged from this agency only recently.

Earlier this year John T. Kucharski, the Chairman of the Renegotiation Board, reviewed the issue to encourage contractors for contractors who perform more efficiently. In his statement the Chairman declared, "...in determining excessive profits, favorable negotiation must be given in the efficiency of the contractor, including

reduction of costs and economy in the use of materials, facilities and manpower. It follows that both the control of production costs and the maintenance of incentives to economical management continue to be as fundamental objectives in renegotiations as they ever were."

► **Risk Factor**—Subsequently, the Renegotiation Board, in publishing final renegotiation regulations in the Federal Register on Mar. 25, 1952, is attempting to give special consideration to the risk factor present in defense contracts.

Among other things the type of risk that will be considered includes risk of forfeiture in the post-emergency market.

act, risks involved in close pricing policies, delivery guarantees, quality and performance guarantees, temporary nature of contracts without extension or resale potential, and the guarantee of work performed by subcontractors.

The Board said that in general it will "...consider whether the contractor's performance of negotiable business is free from risk, or subject to it on the basis of actual experience and not upon speculative or hypothetical possibilities."

The statement went on to state that, while the Board will operate completely separate from the procurement agency,



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► **No Simple Formulae**—Schaefer, the Chairman of the Reconstruction Board outlined the difficulties involved in attempting to solve investigation problems by using shims to level roads, in series of foremen. "This was particularly true in trying to evolve a series of formulas covering numerous or numerous profit standards."

The Chairman went on to assert that

"... when a contractor desires instant success efficiency is his objective, that efficient substantial savings to the government, or which a contractor makes an instant contribution to the defense effort, then benefiting the defense program greatly, such a contractor should be fully rewarded in his investigation procedure."

He said such a contractor should be permitted to obtain a higher profit, expressed as a percentage of sales, than his competitors.

► **A Concrete Example**—As a practical example, the Chairman presented an illustration of how reconstruction would be applied in the case of a hypothetical "X" Corporation producing "widgets." Assuming that the X Corporation had 52 million of reconstructible sales in 1971, on which a normal rate applied, to each sales total \$1.6 million—indicating 20% restored before new widgets in 1972, the Board would fix the following steps:

• In 1947-9, X Corporation sold an average of 51 million a year, mainly to civilians, and its profits were 15% on sales—although its prices were relatively low in this period as well as in 1951 compared with other industries. Assuming that X Corporation was forced to increase its facilities, once after accelerated automation, the government should get a substantial part of the benefit.

Therefore, X's profit per unit sold to the government should be lower in most of higher than its profit on sales during the 1947-9 period.

• The status directly the Board to look at the net worth, with particular reference to the amount and source of private and public capital employed. But the Board's accountant might find it difficult to attach any particular importance to the contractor's net worth, since the Board's accountant reported that it was difficult to compare any reliable acquisition of such between those employed and those not employed in performing reconstructible contracts.

• There appeared to be no prohibition for giving the contractor any priority to credit for financing aid, since the pricing policy provided an adequate margin. Moreover, there was no risk of post-emergency difficulties in this case.

• The Board could not give general consideration to the factors of "contribution to the defense effort, economic and developmental contribution," since the X Widget was a standard item.

• In considering "character and extent of reconstructing," the Board might find that the corporation was critical to a large profit because it located sub-

contractors and accepted know-how in dollars.

• In considering the most important factor of all—efficiency—the Board, on assuming that X Corporation was more efficient, and had a lower cost of production in normal times, would have to allow X a sufficient advantage over its competitors to give X an incentive to continue, and if possible, to enlarge upon its superiority in this respect.

► **Close to Production**—While investigation has yet to have its full impact in reviewing aircraft operations for recent years, it can develop to be a costly affair. This circumstance will prevail despite the heavy bite already imposed



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on savings resulting from price inflation.

For example, during World War II the pulp tax on negotiable was 494%. Any money advanced through negotiation thus represented a net reduction in savings of only 141%. Currently, however, the top tax rate is 70%.

This makes the net reduction by negotiation some 50%, or twice as high as the figure that prevailed during World War II.

Clearly, the negotiable developed in the negotiable process during World War II should be most helpful to government and industry alike. In any event, such company is hoped that its operations will be given a high evaluation in all of the key factors used by the Rating Board. In this respect, as being judged on the merits of its individual case, each company may hope to receive larger profit margins.

Auditor's Role in Procurement

Contractor accounts and records under cost-type contracts, contracts with price redetermination, and industrial property accounts are subject to review by the Auditor General's office of USAF.

Headquarters of the Auditor General is in the Office of the Deputy Chief of Staff, Comptroller, USAF, to whom the Auditor General is directly responsible.

The audit field organization consists of district and section offices, audit section offices in important industrial plants, and an audit liaison office. The eight district offices are in New York, Kansas, Chicago, Atlanta, Fort Worth, Los Angeles, Wiesbaden (Germany) and Tokyo (Japan). To facilitate flow of audit information to procurement personnel, the Auditor General's Liaison Office is located at Headquarters, AMC.

The Auditor General may initiate and direct performance of any audit deemed necessary, but procurement personnel are responsible for requesting audits at all transactions where they may serve to increase the efficiency of procurement.

The Auditor's office is often called on to help the Air Force buyers. Besides reviewing bid and evaluating contracts, this office can furnish accounting and financial information from its files, advise on the accounting aspects of special cost provisions contemplated for a contract, and arrange for the proper sharing contract negotiations of an auditor handling the accounting records of the contracts that are being negotiated.

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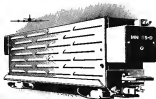
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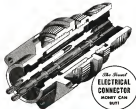
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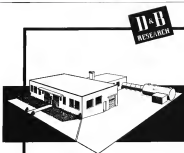
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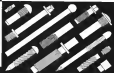
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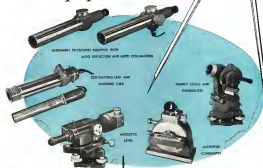
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Firm _____

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City _____ Zone _____ State _____